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(73) 특허권자
트리아드 내셔널 시큐리티, 엘엘씨
미국 87545 뉴멕시코, 로스 알라모스, 엠에스 에이 187, 피.오. 박스 1663, 엘씨/아이피, 로스 알라모스 내셔널 라보라토리
오레곤 헬스 앤드 사이언스 유니버시티
미국 오레곤주 97239 포틀랜드 샘 잭슨 파크 로드 사우스웨스트 3181
비르 바이오테크놀로지, 인코포레이티드
미국 94158 캘리포니아 샌프란시스코 오웬스 스트리트 1800 스위트 900
(72) 발명자
브루어닝, 에릭
미국, 오레곤 97089, 다마스쿠스, 16687 에스이 반 자일 드라이브
프뤼, 클라우스
미국, 오레곤 97229, 포틀랜드, 1980 엔더블유 113 애비뉴
(뒷면에 계속)
(74) 대리인
특허법인한얼

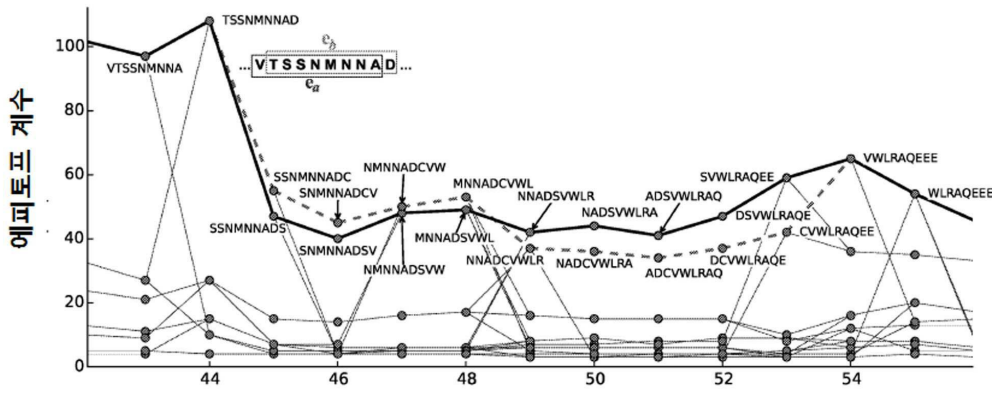
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(54) 발명의 명칭 **하나 이상의 집단 에피센서스 항원을 포함하는 HIV 백신 조성물**

(57) 요 약

본원은 에피그래프(EpiGraph) 접근법을 이용하여 결정된 집단 에피센서스 항원 및 담체를 포함하는 HIV-1 백신을 제공한다. 또한, 담체, 집단 에피센서스 항원, 및 맞춤형 항원을 포함하는 HIV-1 백신을 제공한다. 또한, 에피그래프 접근법을 이용하여 생성된 항원 아미노산 서열을 사용하여, 지리적 영역 내의 다양성을 최적으로 커버하는 백신 항원을 고안하는 단계 및 상기 고안된 백신 항원을 생산하는 단계를 포함하는, 개체를 위한 HIV-1 백신을 고안하고 생산하는 방법을 제공한다. 또한, 하나 이상의 에피그래프 아미노산 서열을 고안하는 단계, 하나 이상의 에피그래프 아미노산 서열 및 벡터를 포함하는 백신을 생산하는 단계, 백신을 개체에 투여하는 단계를 포함하는, 효과기 기억 T 세포 반응을 유도하는 방법을 제공한다. 또한, 기술된 HIV-1 백신의 유효량을 이를 필요로 하는 개체에 투여하는 단계를 포함하는, 개체에서 HIV-1을 치료하는 방법을 제공한다.

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(72) 발명자
피커, 루이스
미국, 오레곤 97229, 포틀랜드, 25 엔더블유 95 애비뉴
코르버, 베트 티.엠.
미국, 뉴 멕시코 87506, 산타페, 5비 안젤리토스 로드
타일러, 제임스
미국, 뉴 멕시코 87506, 산타페, 5비 안젤리토스 로드
마샬, 에밀리
미국, 오레곤 97214, 포틀랜드, 1916 에스이 32 플레이스

명 세 서

청구범위

청구항 1

서열번호 706의 아미노산 서열로 이루어진 폴리펩티드.

청구항 2

서열번호 706의 아미노산 서열, 및

서열번호 709 내지 712 및 726 내지 729 중 어느 하나의 아미노산 서열

로 이루어진 폴리펩티드.

청구항 3

서열번호 706의 아미노산 서열 및 서열번호 710의 아미노산 서열로 이루어진 폴리펩티드.

청구항 4

인간 사이토메갈로바이러스(HCMV) 백본(backbone) 또는 레서스(rhesus) 사이토메갈로바이러스(RhCMV) 백본을 포함하는 벡터로서, HCMV 또는 RhCMV 백본은 제1항 내지 제3항 중 어느 한 항의 폴리펩티드를 포함하는 융합 항원을 인코딩하는 핵산 서열을 포함하는 벡터.

청구항 5

제4항에 있어서,

(a) HCMV 또는 RhCMV 백본은 UL130-128 유전자 부위가 결여되어 있거나;

(b) HCMV 또는 RhCMV 백본은 외피 (tegument) 단백질 pp71을 인코딩하는 UL82 유전자가 결여되어 있거나; 또는

(c) HCMV 또는 RhCMV 백본은 UL130-128 유전자 부위, 및 외피 단백질 pp71을 인코딩하는 UL82 유전자가 결여되어 있는 벡터.

청구항 6

제5항에 있어서, HCMV 또는 RhCMV 백본은 UL130-128 유전자 부위, 및 외피 단백질 pp71을 인코딩하는 UL82 유전자가 결여되어 있는 벡터.

청구항 7

제4항에 있어서, 핵산 서열은 서열번호 706의 폴리펩티드를 포함하는 융합 항원을 인코딩하는 벡터.

청구항 8

제4항에 있어서, 핵산 서열은 서열번호 706의 폴리펩티드를 포함하는 융합 항원을 인코딩하고, 벡터는 UL130-128 유전자 부위가 결여되어 있는 벡터.

청구항 9

제4항에 있어서, 대상체에서 항-HIV-1 면역 반응을 유도하는 방법에 사용하기 위한 벡터.

청구항 10

제4항에 있어서, 핵산 서열은 서열번호 706의 폴리펩티드를 포함하는 융합 항원을 인코딩하고, 벡터는 UL130-128 유전자 부위가 결여되어 있고, 대상체에서 항-HIV-1 면역 반응을 유도하는 방법에 사용하기 위한 벡터.

청구항 11

제4항에 있어서, 대상체에서 항-HIV-1 이펙터 기억 T 세포 반응을 유도하는 방법에 사용하기 위한 벡터.

청구항 12

제4항에 있어서, 핵산 서열은 서열번호 706의 폴리펩티드를 포함하는 융합 항원을 인코딩하고, 벡터는 UL130-128 유전자 부위가 결여되어 있고, 대상체에서 항-HIV-1 이펙터 기억 T 세포 반응을 유도하는 방법에 사용하기 위한 벡터.

청구항 13

제4항에 있어서, 대상체에서 HIV-1을 치료하는 방법에 사용하기 위한 벡터.

청구항 14

제4항에 있어서, 핵산 서열은 서열번호 706의 폴리펩티드를 포함하는 융합 항원을 인코딩하고, 벡터는 UL130-128 유전자 부위가 결여되어 있고, 대상체에서 HIV-1을 치료하는 방법에 사용하기 위한 벡터.

청구항 15

삭제

청구항 16

삭제

청구항 17

삭제

청구항 18

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발명의 설명

기 술 분 야

[0001] 관련 출원의 교차-참조

[0002] 본 출원은, 이들 각각이 온전히 본원에 참조로서 포함되는, 2014년 10월 3일자로 출원된 미국 가특허 출원 제62/059,497호 및 2014년 10월 3일자로 출원된 미국 가특허 출원 제62/059,506호의 우선권을 주장한다.

[0003] 전자적으로 제출된 서열목록에 대한 참조

[0004] 본 출원과 함께 ASCII 텍스트 파일(파일명: 3525.010PC02 Seq listing_ST25.txt; 크기: 3,634,253 바이트; 및 생성 일자: 2015년 10월 5일)인 전자적으로 제출된 서열목록의 내용은 온전히 참조로서 본원에 포함된다.

[0005] 본 발명은 일반적으로 HIV에 관한 것이고, 특히 HIV 백신에 관한 것이다.

배 경 기 술

[0006] 2013년에 대략 230만 건의 새로운 인간 면역결핍 바이러스(HIV) 감염자, 3,500만명 이상의 HIV 환자 및 160만 명의 후천성 면역 결핍 증후군(AIDS) 사망이 발생하였다. HIV/AIDS 치료에 큰 진전이 있었음에도, 약물 요법은 약 $1/10^6$ 세포의 빈도로 휴지중인 CD4+ T 세포에 존재하는 잠재적인 바이러스 저장소(reservoirs)를 제거할 수 없기 때문에, HIV에 감염된 모든 개인은 그들의 남은 평생 동안 항 레트로바이러스 요법(ART)으로 치료되어야 할 것이다(Eriksson, S. 2013. PLoS Pathog 9 : e1003174 참조).

[0007] 잠재적 HIV 저장소를 제거하기 위한 주요 전략은 일반적으로 히스톤-탈 아세틸화 효소(HDAC) 저해제를 사용하여 잠복 바이러스를 재활성화하는데 목적이 있지만, HDAC-저해제를 이용한 임상 연구는 잠복 저장소를 지속적으로 감소시키지 못했다. 이에 대한 가능한 하나의 이유는 HIV-특이적 CD8+ T 세포가 휴지중인 CD4+ T 세포를 제거할 수 없다는 것이다.

[0008] HIV-1가 이미 감염된 개인에서 제거되었던 몇 가지 사례만이 보고되었다. 효과적인 요법이 개발될 때까지, HIV-1 환자인 추정된 약 3,500만 명의 개인은 박멸을 위한 모든 노력에도 내성이었던 바이러스 저장소를 억제하기 위해 항바이러스 약물을 계속 사용할 것이다.

[0009] AIDS에 대한 치료법은 아직 파악하기 힘들지만, 최근의 연구 결과는 엄격한 면역학적 제어가 시간이 지남에 따라 HIV를 제거할 수 있음을 제시하였다. 구체적으로, 원숭이 면역결핍 바이러스(simian immunodeficiency virus, SIV) 항원을 발현하는 사이토메갈로바이러스(CMV)-기반 벡터로 백신 접종한 레서스 원숭이(rhesus macaques, RM)가 처음에는 감염되었으나, 감염 후 1 내지 2년 후에 몇 가지 엄격한 기준에서는 SIV가 검출되지 않았다. 이 결과는, 이를 연구에서 사용된 고독성의 SIVmac239 균주가 이전의 모든 백신 시도를 저지했다는 사실에 비추어 볼 때, 훨씬 주목할 만하다. 이러한 결과는, 현재의 패러다임을 예방 HIV 백신에 초점을 맞춘 것으로부터 HIV/AIDS에 대한 면역요법이 결국에는 이 전염병에 대항하는 필수적인 부분이 되는 것으로 확대시키고 있다. 따라서, 예방 백신 외에도, 여전히 HIV-1 환자인 개인을 치료하는데 효과적인 요법이 요구되고 있다. 구체적으로, 임상 시험을 준비하는데 있어 예방 및 치료용 HIV 백신을 고안, 제조 및 시험할 필요성이 여전히 존재한다.

발명의 내용

해결하려는 과제

[0010] 본원은 전장 서열, 이의 일부 또는 이들의 임의의 조합을 포함하는 HIV/SIV Gag, Nef, Pol, Env에 상응하는 아미노산 서열을 포함하는 하나 이상의 에피그래프(Epigraph) 항원 서열을 포함하는 HIV/SIV 폴리펩티드를 제공한

다. 또한, 본원은 HIV/SIV Gag, Nef, Pol, Env 또는 이들의 조합에 상응하는 아미노산 서열을 포함하는 하나 이상의 집단 에피센서스 항원 서열을 포함하는 HIV/SIV 폴리펩티드를 제공한다. 또한, 본원은 하나 이상의 집단 에피센서스 항원 서열을 포함하는 HIV/SIV 폴리펩티드를 포함하는 하나 이상의 담체를 제공한다. 또한, 본원은 HIV/SIV Gag, Nef, Pol, Env 또는 이들의 조합에 상응하는 아미노산 서열을 포함하는 하나 이상의 맞춤형(tailored) 항원 서열을 포함하는 HIV/SIV 폴리펩티드를 제공한다. 본 발명의 HIV/SIV 폴리펩티드는 하나 이상의 HIV-1 맞춤형 항원을 포함할 수 있고, 상기 폴리펩티드는 서열번호: 692-696 및 서열번호: 754-789로 이루어진 군으로부터 선택된 아미노산 서열을 포함한다. 또한, 본원은 하나 이상의 맞춤형 항원 서열을 포함하는 HIV/SIV 폴리펩티드를 포함하는 하나 이상의 담체를 제공한다. 서열번호: 691-789를 가지는 에피그래프 항원 서열이 본원에 제공된다.

[0011] 본원은 하나 이상의 담체 및 하나 이상의 집단 에피센서스 항원을 포함하는 HIV-1 백신을 제공한다. 또한, 본원은 집단 에피센서스 항원 및 하나 이상의 맞춤형 항원을 발현할 수 있는 벡터를 포함하는 HIV-1 백신을 제공한다.

[0012] 일부 실시양태에서, HIV-1 집단 에피센서스 항원은 Gag, Pol, Nef, Env, Tat, Rev, Vpr, Vif 또는 Vpu로부터의 에피토프를 포함한다. 일부 실시양태에서, 상기 HIV-1 집단 에피센서스 항원은 둘 이상의 HIV-1 집단 에피센서스 항원을 포함하는 융합 항원이다. 일부 실시양태에서, HIV-1 집단 에피센서스 항원은 미국에서 유행성인 HIV-1 B 클레이드(clade)에 집중적이다. 일부 실시양태에서, HIV-1 집단 에피센서스 항원은 남아프리카에서 유행성인 HIV-1 C 클레이드에 집중적이다. 일부 실시양태에서, HIV-1 집단 에피센서스 항원은 태국에서 유행성인 HIV-1 2-클레이드에 집중적이다. 일부 실시양태에서, HIV-1 집단 에피센서스 항원은 HIV-1 M-그룹 글로벌 세트(global set)에 집중적이다.

[0013] 일부 실시양태에서, HIV-1 집단 에피센서스 항원은 Gag로부터의 에피토프를 포함한다. 일부 실시양태에서, HIV-1 집단 에피센서스 항원은 HIV-1의 보존 부위로부터의 에피토프를 포함한다. 일부 실시양태에서, HIV-1 집단 에피센서스 항원은 Gag, Pol 또는 Nef의 보존 부위로부터의 에피토프를 포함한다. 일부 실시양태에서, Gag의 보존 부위로부터의 에피토프는 Gag의 p24 캡시드 단백질로부터의 에피토프이다.

[0014] 일부 실시양태에서, HIV-1 맞춤형 항원은 Gag, Pol, Nef, Env, Tat, Rev, Vpr, Vif 또는 Vpu로부터의 에피토프를 포함한다. 일부 실시양태에서, HIV-1 맞춤형 항원은 HIV-1 M-그룹 글로벌 세트에 집중적이다. 일부 실시양태에서, HIV-1 맞춤형 항원은 남아프리카에서 유행성인 HIV-1 C 클레이드에 집중적이다. 일부 실시양태에서, HIV-1 맞춤형 항원은 미국에서 유행성인 HIV-1 B 클레이드에 집중적이다.

[0015] 또한, 기술된 HIV-1 백신의 유효량을 이를 필요로 하는 개체에 투여하는 것을 포함하는, 개체에서 HIV-1 감염을 예방 또는 치료하는 방법을 추가로 제공한다. 또한, 개인에서 HIV-1 바이러스의 서열을 결정하는 단계, 지리적 영역 내의 다양성을 최적으로 커버하도록 고안된 백신 항원을 선택하는 단계, 벡터 내로 백신 항원을 삽입하는 단계를 포함하는, 개체에 대한 HIV-1 백신을 고안하고 생산하는 방법을 추가로 제공한다. 또한, 본원은 기술된 백신의 유효량을 이를 필요로 하는 개체에 투여하는 단계를 포함하는, 개체에서 HIV-1 감염을 치료하는 방법을 제공한다.

[0016] 또한, 본원은 하나 이상의 담체 및 에피그래프 접근법을 이용하여 결정된 집단 에피센서스 항원을 포함하는 HIV-1 백신을 제공한다. 또한, 본원은 항원 아미노산 서열 선택의 에피그래프 방법을 이용하여 생성된 백신 항원 아미노산 서열을 사용하여 지리적 영역 내에서 다양성을 최적으로 커버하는 백신 항원을 고안하는 단계, 및 상기 고안된 백신 항원을 생산하는 단계를 포함하는 방법을 제공한다. 또한, 본원은 서열분석(sequencing)에 의해 개인에서 HIV-1 바이러스의 아미노산 서열을 결정하는 단계, 항원 아미노산 서열 선택의 에피그래프 방법을 이용하여 생성된 백신 항원 아미노산 서열을 사용하여 지리적 영역 내에서 다양성을 최적으로 커버하도록 고안된 백신 항원을 선택하는 단계, 및 백신 항원을 벡터 내로 삽입하는 단계를 포함하는, 개체에 대한 HIV-1 백신을 고안하고 생산하는 방법을 제공한다.

[0017] 또한, 본원은 하나 이상의 에피그래프 아미노산 서열을 결정하는 단계, 하나 이상의 에피그래프 항원 아미노산 서열 및 하나 이상의 담체를 포함하는 백신을 생산하는 단계, 및 백신을 이를 필요로 하는 개체에 투여하는 단계를 포함하는, 효과기 기억 T 세포 반응을 유도하는 방법을 제공한다. 또한, 기술된 HIV-1 백신의 유효량을 이를 필요로 하는 개체에 투여하는 단계를 포함하는, 개체에서 HIV-1을 치료하는 방법을 제공한다. 또한, 본원은 기술된 HIV-1 백신의 유효량을 이를 필요로 하는 개체에 투여하는 단계를 포함하는, 개체에서 HIV-1 감염을 예방하는 방법을 제공한다.

과제의 해결 수단

[0018] 상세한 설명의 양태에 관련된 다양한 용어가 명세서 및 청구범위 전반에 걸쳐 사용된다. 이러한 용어는 달리 지시하지 않는 한, 당해 분야의 통상적인 의미가 부여된다. 다른 구체적으로 정의된 용어는 본원에서 제공한 정의와 일치하는 방식으로 해석되어야 한다.

[0019] 본 명세서 및 첨부된 청구범위에서 사용된 바와 같이, 단수 형태 "a", "an" 및 "the"는 그 내용이 명확하게 달리 지시하지 않는 한, 복수 지시 대상을 포함한다. 따라서, 예를 들어, "세포"에 대한 언급은 둘 이상의 세포들의 조합 등을 포함한다.

[0020] 양(amount), 지속 시간(temporal duration) 등과 같은 측정 가능한 값을 언급할 때, 본원에서 사용되는 바와 같은 "약(about)"이라는 용어는, 특정된 값으로부터 ± 20%까지의 변화를 포함하는 것을 의미하며, 이러한 변화는 개시된 방법을 수행하기에 적절하다. 달리 지시되지 않는 한, 명세서 및 청구 범위에서 사용된 성분의 양, 분자량, 반응 조건 등과 같은 성질을 나타내는 모든 숫자는 모든 경우에서 용어 "약"에 의해 변경되는 것으로 이해되어야 한다. 따라서, 반대로 지시되지 않는 한, 하기 명세서 및 첨부된 청구범위의 수치 파라미터는, 본 발명에 의해 얻고자 하는 원하는 특성에 따라 변할 수 있는 근사치이다. 최소한, 청구범위의 범주에 등가인 균등론(doctrine)의 적용을 제한하려는 시도로서가 아닌, 각 수치 파라미터는 적어도 보고된 유효 자릿수의 숫자에 비추어, 그리고 통상의 반올림 기술을 적용함으로써 해석되어야 한다.

[0021] 본 발명의 넓은 범주를 개시하는 수치 범위 및 파라미터가 근사치임에도 불구하고, 특정 실시예에 기술된 수치는 가능한 한 정확하게 보고된다. 그러나, 모든 수치는 각각의 시험 측정에서 발견된 표준 편차에서 필연적으로 발생하는 특정 오류를 내재적으로 포함한다.

[0022] 상기 및 명세서 전체에서 사용되는 바와 같이, 용어 "유효량"은 관련된 장애, 상태 또는 부작용의 치료에 관한 바람직한 결과를 달성하는데 효과적인, 필요한 투여량 및 필요한 기간 동안의, 양을 지칭한다. 본 발명의 성분의 유효량은 특정 백신, 선택된 성분 또는 조성물, 투여 경로 및 개인에서 원하는 결과를 유도하는 성분의 능력뿐만 아니라, 질병 상태 또는 완화되는 병태, 증상의 중증도, 개인의 호르몬 수준, 나이, 성별, 체중, 환자의 상태 및 치료되는 병리학적 상태의 중증도와 같은 인자, 동시 투여 또는 그 후에 특정 환자에 수반되는 특수 식이요법, 및 당업자가 인식할 수 있는 다른 인자들과 관련하여 환자마다 달라질 것이며, 적절한 투약량은 주치의의 재량에 달려있다. 투약처방(Dosage regime)은 개선된 치료 반응을 제공하도록 조절될 수 있다. 유효량은 또한 성분의 임의의 독성 또는 유해한 효과보다 우세한 양이다.

[0023] 용어 "투여하는"은, 본 발명의 화합물 또는 조성물을 직접 투여하거나, 또는 체내에서 동등한 양의 활성 화합물 또는 물질을 형성할 전구 약물(prodrug), 유도체 또는 유사체를 투여하는 것을 의미한다.

[0024] 용어 "개체(subject)", "개인(individual)" 및 "환자(patient)"는 본원에서 호환하여 사용되며, 본 발명에 따른 약학 조성물로 예방적 치료를 비롯한 치료가 제공되는 동물, 예를 들어 인간을 지칭한다. 본원에서 사용된 바와 같이 용어 "개체"는, 인간 및 비-인간 동물을 지칭한다. 용어 "비-인간 동물" 및 "비-인간 포유 동물"은, 본원에서 호환하여 사용되며, 모든 척추동물, 예를 들어, 포유동물, 예컨데 비-인간 영장류 (특히, 고등 영장류), 양, 개, 설치류 (예: 마우스 또는 랫트), 기니 피그, 염소, 돼지, 고양이, 토끼, 소, 말, 및 파충류, 양서류, 닭 및 칠면조와 같은 비-포유 동물을 포함한다.

[0025] 용어 "칵테일(cocktail)"은 환자에게 조합하여 전달되도록 의도된 항원의 세트를 지칭한다.

[0026] 용어 "에피센서스(episensus)"는 에피토프 기반의 컨센서스 서열(consensus sequence)을 의미한다. 이는 그의 에피토프가 천연 서열의 기준 세트(reference set)에서의 에피토프와 가능한 한 근사하게 일치하는 서열이다. 용어 "에피토프(epitope)" 및 "잠재적 에피토프"는, 종종 더 긴 천연 서열 또는 백신 항원 서열의 k-문자 하부서열(subsequence)의 맥락에서 k-문자 (전형적으로 k는 8-12의 범위임)의 서열을 지칭한다. T 세포는 면역 반응에서 그러한 펩타이드를 인식할 수 있다.

[0027] 용어 "에피그래프(EpiGraph)"는, 최적의 에피센서스 서열 또는 다양한 바이러스 서열 집단에 대한 최적의 커버리지를 제공하는 결합된 서열 세트를 제공하는 서열을 생성하기 위해 개발된 새로운 계산 전략을 의미한다.

[0028] 용어 "에피그래프 서열" 또는 "에피센서스 항원"은, 에피그래프 알고리즘에 기초하여 고안된 백신 삽입체을 지칭한다.

[0029] 용어 "집단 에피센서 항원(population episensus antigen)"은, HIV 서열의 집단에 대해 "집중적(central)"인,

에피그래프 알고리즘으로 유도된 서열을 지칭한다. 집단은 특정 HIV 클레이드, 클러스터화 알고리즘 기반 맞춤형 에피토프를 사용하여 유도된 서열의 클러스터, 또는 전세계적 전염병일 수 있다. "집중적"은 잠재적 에피토프를 공유하는 관점에서 정의되고, 따라서 이는 집단의 최대 평균 에피토프 커버리지를 제공하는 계산적으로 유도되는 서열이다.

[0030] 에피그래프 서열은 예방적, 예방 백신에 대한 해법으로서, 사용될 수 있고, 또는 개별 감염에 일치하도록 맞춤화가 될 것인 치료 백신의 고안을 위한 보다 복잡한 전략의 일부로서 채택될 수 있다. 한 세트의 용어 "맞춤형 백신 세트(tailored vaccine set)"는 제조용으로 고안된 백신 항원 서열을 말하며, 그로부터 이 집단 항원이 치료 백신으로 전달하기 위해 환자의 바이러스에 가장 일치하는 것으로 선택될 수 있다.

[0031] 용어 "맞춤형 항원" 또는 "맞춤형 에피센서스 항원"은, 치료 백신으로서 그 환자에 전달하기 위한 환자가 감염된 HIV-1 균주에 대한 최선의 일치를 토대로 특이적으로 선택될 것인 "맞춤형 백신 세트"로부터의 하나 이상의 아미노산 서열을 말한다.

[0032] 본원에 사용된 바와 같이 치료제 또는 완화제를 비롯한 이의 상이한 gudxoQNs만 아니라 용어 "치료(treatment)" 또는 "요법(therapy)"은, 감염된 사람의 치료를 지칭한다. 본원에 사용된 바와 같이, 용어 "치료하는(treating)"은, 병태, 질환 또는 장애의 적어도 하나 이상의 유해 또는 부작용 또는 증상을 경감 또는 감소시키는 것을 포함한다. 이러한 병태, 질환 또는 장애는 HIV 감염일 수 있다.

[0033] 본원에 사용된 바와 같이, 용어 "예방(prevention)" 또는 "예방(prophylaxis)"은, 개체가 예를 들어, HIV, SIV 또는 관련 바이러스에 감염되는 것을 예방하거나, 개체가 그에 감염될 위험성을 줄이거나, 이의 전파를 막거나, 전파의 위험성을 줄이는 것을 지칭한다.

[0034] "약학적으로 허용 가능한"은, 건전한 의학적 판단의 범위 내에서, 과도한 독성, 자극, 알레르기 반응, 또는 합리적인 이익/위험 비율에 상응하는 다른 합병증이 없는, 인간 및 동물의 조직과의 접촉에 적합한 그러한 화합물, 재료, 조성물 및/또는 투여 형태를 지칭한다.

[0035] 사용될 수 있는 벡터는 플라스미드, 박테리아 벡터 및 바이러스 벡터를 포함하지만, 이에 제한되지 않는다. 바이러스 벡터는 사이토메갈로바이러스(CMV) 벡터를 포함한다. 치료 백신 전달에 사용하기 위한 이러한 CMV 벡터의 이점은 이들이 새로운 CD8+ T 세포 에피토프 패러다임을 생성하고, 더 강력하고 지속적인 반응을 유도한다는 것이다. 동물 모델에서 이러한 바이러스 벡터를 기반으로 한 백신이 바이러스 감염을 제거할 수 있음이 밝혀짐에 따라(Hansen, SG, 2013 : Science 340 : 1237874), 이러한 접근법은 치료 백신에 대해 맞춤형 백신이 유용할 수 있는 환경(setting)을 보장한다.

[0036] 다른 바이러스 벡터로는 종두증 앙카라(vaccinia Ankara) 및 카나리아폭스(canarypox)를 포함하는, 폭스바이러스(종두증); 아데노바이러스 타입 5(Ad5)를 포함하는 아데노바이러스; 루벨라; 센다이바이러스; 라브도바이러스; 알파바이러스; 및 아데노-연관 바이러스를 포함할 수 있다. 대안적으로, 에피그래프 백신 항원은 백신의 DNA, RNA 또는 단백질 성분으로 전달될 수 있다. 이는 항원 고안 전략이기 때문에, 에피그래프로 고안된 백신 항원은 본질적으로 백신 항원 전달의 임의의 모드와 호환될 수 있다.

[0037] 특정 실시양태에서, 에피그래프 아미노산 서열을 사용하여 고안된 백신은 단일 항원을 갖는다. 특정 실시양태에서, 에피그래프 아미노산 서열을 사용하여 고안된 백신은 항원 세트를 갖는다.

[0038] 특정 실시양태에서, 에피그래프 항원 서열은 예방 백신 환경에서 사용될 수 있다.

[0039] 특정 실시양태에서, 에피그래프 전략은 예방 백신에 대한 에피토프 커버리지를 완전히 최적화하는 서열을 만드는데 사용될 수 있다. 이는 하나의 서열일 수 있거나, 또는 예방 백신으로서 서로 보완하도록 고안된 여러 서열일 수 있다. 에피그래프 백신은 플라스미드, 박테리아 벡터 및 바이러스 벡터를 포함하는 임의의 백터에서 사용될 수 있으나, 이에 제한되지 않는다.

[0040] 에피그래프 알고리즘에서, 천연 서열은 큰 노드 그래프를 특징으로 하며, 각 노드는 천연 서열에서 나타나는 에피토프에 상응한다. 방향성 엣지는 대응하는 2개의 에피토프 스트링(string)이 "일치된" 경우 두 노드를 연결하는데, 이는 첫 번째 스트링의 마지막 k-1 문자들이 두 번째 스트링의 처음 k-1 문자들과 일치함을 의미한다(예를 들어: "EPTAPPAEPTAP"(서열번호: 796) 및 "PTAPPAEPTAPP"(서열번호: 797)은 일관된 k=12-mer이다). 2개의 스트링이 일치하면, k+1 길이의 스티링(예를 들어, "EPTAPPAEPTAPP")(서열번호: 798)은 두 에피토프 모두를 함유한다. 보다 일반적으로, 노드 및 엣지의 이 그래프를 통과하는 경로는 그래프의 각 노드에 상응하는 k-mer 서브스트링(substring)을 포함하는 단일 스트링에 상응한다. 각 노드는 기준 세트에서 얼마나 많은 서열이 그 노

드에 상응하는 서브스트링을 나타내는지에 따라 가중치가 적용된다. 에피그래프 알고리즘은 이를 가중치의 합을 최대화하고, 따라서 가장 큰 커버리지를 제공하는 이 전체 그래프를 통과하는 경로를 규명하기위해 다이나믹한 프로그래밍 기법을 사용한다.

[0041] 제공된 특정 실시양태는 벡터 및 집단 에피센서스 항원을 포함하는 HIV-1 백신, 또는 세트로서 사용되도록 고안된 최적화된 에피그래프 항원의 조합을 포함한다. 백신에는 사용 가능한 많은 다른 벡터가 있다. 예를 들어, 사용 가능한 벡터의 하나의 유형은 바이러스 벡터이다. 이러한 바이러스 벡터는 인간 사이토메갈로바이러스(HCMV), 폭스바이러스, 아데노바이러스, 루벨라, 센다이바이러스, 라브도바이러스, 알파바이러스 또는 아데노-연관 바이러스를 포함할 수 있다. 백신은 또한, DNA, RNA를 사용하거나, 발현된 단백질 또는 단백질의 일부로서 포함되는 에피그래프 단백질을 코딩하는 유전자로서 전달될 수 있다.

[0042] 특정 실시양태에서, 개시된 백신의 에피그래프 항원은 HIV-1 Gag 단백질로부터 유래될 수 있다. 또 다른 실시양태에서, HIV-1 Gag 단백질은 HIV-1 Gag 단백질의 N-말단에서 미리스토일화(myristoylation) 서열을 제거함으로써 불활성화되어 있다. 또 다른 실시양태에서, 에피그래프 항원은 HIV-1 Pol 또는 Nef 단백질, 또는 실제로 Env, Tat, Rev, Vif 또는 Vpu를 비롯한 임의의 다른 HIV 단백질로부터 유래할 수 있다.

[0043] 특정 실시양태에서, 집단 에피센서스 항원은 에피그래프 접근법을 이용하여 결정될 수 있다. 이후, 이 집단 에피센서스 항원은 백신을 생산하기 위해 사용될 수 있다. 대안적으로, 에피그래프는 세트로 사용되도록 고안된 서열의 조합으로 고안될 수 있다. HIV-1은 지리적 위치를 기반으로 한 클레이드로 나눌 수 있다. 일부 실시양태에서, 개시된 백신에서 집단 에피센서스 항원은 미국에서 유행성인 HIV-1 B 클레이드에 집중적이다. 다른 실시양태에서, 개시된 백신에서 집단 에피센서스 항원은 남아프리카에서 유행성인 HIV-1 C 클레이드에 집중적이다. 또 다른 실시양태에서, 개시된 백신은 집단 에피센서스 항원은 태국에서 유행성인 HIV-1 2-클레이드에 집중적이다. 또 다른 실시양태에서, 개시된 백신에서 집단 에피센서스 항원은 HIV-1 M-그룹 글로벌 세트에 집중적이다.

[0044] 일부 실시양태에서, HIV-1 집단 에피센서스 항원은 Gag, Pol, Nef, Env, Tat, Rev, Vpr, Vif 또는 Vpu로부터의 에피토프를 포함한다. 일부 실시양태에서, HIV-1 집단 에피센서스 항원은 Gag로부터의 에피토프를 포함하고, 서열번호: 691, 서열번호: 697, 서열번호: 698, 서열번호: 699 또는 서열번호: 700의 아미노산 서열을 포함한다. 일부 실시양태에서, HIV-1 집단 에피센서스 항원은 HIV-1의 보존 부위로부터의 에피토프를 포함한다. 일부 실시양태에서, HIV-1 집단 에피센서스 항원은 Gag, Pol 또는 Nef의 보존 부위로부터의 에피토프를 포함한다. 일부 실시양태에서, Gag의 보존 부위로부터의 에피토프는 Gag의 p24 캡시드 단백질로부터의 에피토프이다.

[0045] 일부 실시양태에서, HIV-1 집단 에피센서스 항원은 2개 이상의 HIV-1 집단 에피센서스 항원을 포함하는 융합 항원이다. 일부 실시양태에서, 융합 항원은 Gag 에피토프를 포함하는 HIV-1 집단 에피센서스 항원 및 Nef 에피토프를 포함하는 HIV-1 집단 에피센서스 항원을 포함한다. 일부 실시양태에서, 융합 항원은 Gag의 보존 부위로부터의 에피토프를 포함하는 HIV-1 집단 에피센서스 항원 및 Nef의 보존 부위로부터의 에피토프를 포함하는 HIV-1 집단 에피센서스 항원을 포함한다. 일부 실시양태에서, Gag의 보존 부위로부터의 융합 항원의 에피토프는 Gag의 p24 캡시드 단백질로부터의 에피토프이다.

[0046] 일부 실시양태에서, HIV-1 집단 에피센서스 항원은 미국에서 유행성인 HIV-1 B 클레이드에 집중적이다. 일부 실시양태에서, HIV-1 B 클레이드 집단 에피센서스 항원은 Gag 에피토프를 포함하고, 서열번호: 730, 서열번호: 732 또는 서열번호: 778의 아미노산 서열을 포함한다. 일부 실시양태에서, HIV-1 B 클레이드 집단 에피센서스 항원은 Gag의 p24 캡시드 단백질로부터의 에피토프를 포함하고, 서열번호: 731, 서열번호: 733 또는 서열번호: 779의 아미노산 서열을 포함한다. 일부 실시양태에서, HIV-1 B 클레이드 집단 에피센서스 항원은 Nef 에피토프를 포함하고, 서열번호: 734 또는 서열번호: 736의 아미노산 서열을 포함한다. 일부 실시양태에서, HIV-1 B 클레이드 집단 에피센서스 항원은 Nef의 보존 부위로부터의 에피토프를 포함하고, 서열번호: 735 또는 서열번호: 737의 아미노산 서열을 포함한다. 일부 실시양태에서, HIV-1 B 클레이드 집단 에피센서스 항원은 Pol의 에피토프를 포함하고, 서열번호: 703, 서열번호: 704, 서열번호: 738 또는 서열번호: 740의 아미노산 서열을 포함한다. 일부 실시양태에서, HIV-1 B 클레이드 집단 에피센서스 항원은 Pol 보존 부위로부터의 에피토프를 포함하고, 서열번호: 739 또는 서열번호: 741의 아미노산 서열을 포함한다. 일부 실시양태에서, HIV-1 B 클레이드 집단 에피센서스 항원은, (1) Gag 에피토프를 포함하는 HIV-1 B 클레이드 집단 에피센서스 항원, 및 (2) Nef 에피토프를 포함하는 HIV-1 B 클레이드 집단 에피센서스 항원을 포함하는 융합 항원이고, 여기에서 융합 항원은 서열번호: 701 또는 서열번호: 702의 아미노산 서열을 포함한다. 일부 실시양태에서, HIV-1 B 클레이드 집단 에피센서스 항원은, (1) Gag의 p24 캡시드 단백질로부터의 에피토프를 포함하는 HIV-1 B 클레이드 집단 에피센서스 항원, 및 (2) Nef의 보존 부위로부터의 에피토프를 포함하는 HIV-1 B 클레이드 집단 에피센서스 항원을 포함

한다.

[0047] 일부 실시양태에서, HIV-1 집단 에피센서스 항원은 남아프리카에서 유행성인 HIV-1 C 클레이드에 집중적이다. 일부 실시양태에서, HIV-1 C 클레이드 집단 에피센서스 항원은 Gag 에피토프를 포함하고, 서열번호: 742, 서열번호: 744 또는 서열번호: 766의 아미노산 서열을 포함한다. 일부 실시양태에서, HIV-1 C 클레이드 집단 에피센서스 항원은 Gag의 p24 캡시드 단백질로부터의 에피토프를 포함하고, 서열번호: 743, 서열번호: 745 또는 서열번호: 767의 아미노산 서열을 포함한다. 일부 실시양태에서, HIV-1 C 클레이드 집단 에피센서스 항원은 Nef 에피토프를 포함하고, 서열번호: 746 또는 서열번호: 748의 아미노산 서열을 포함한다. 일부 실시양태에서, HIV-1 C 클레이드 집단 에피센서스 항원은 Nef의 보존 부위로부터의 에피토프를 포함하고, 서열번호: 747 또는 서열번호: 749의 아미노산 서열을 포함한다. 일부 실시양태에서, HIV-1 C 클레이드 집단 에피센서스 항원은 Pol 에피토프를 포함하고, 서열번호: 750 또는 서열번호: 752의 아미노산 서열을 포함한다. 일부 실시양태에서, HIV-1 C 클레이드 집단 에피센서스 항원은 pol의 보존 부위로부터의 에피토프를 포함하고, 서열번호: 751 또는 서열번호: 753의 아미노산 서열을 포함한다. 일부 실시양태에서, HIV-1 C 클레이드 집단 에피센서스 항원은, (1) Gag 에피토프를 포함하는 HIV-1 C 클레이드 집단 에피센서스 항원, 및 (2) Nef 에피토프를 포함하는 HIV-1 C 클레이드 집단 에피센서스 항원을 포함한다. 일부 실시양태에서, HIV-1 C 클레이드 집단 에피센서스 항원은, (1) Gag의 p24 캡시드 단백질로부터의 에피토프를 포함하는 HIV-1 C 클레이드 집단 에피센서스 항원, 및 (2) Nef의 보존 부위로부터의 에피토프를 포함하는 HIV-1 C 클레이드 집단 에피센서스 항원을 포함한다.

[0048] 일부 실시양태에서, HIV-1 집단 에피센서스 항원은 태국에서 유행성인 HIV-1 2-클레이드에 집중적이다. 일부 실시양태에서, HIV-1 2-클레이드 집단 에피센서스 항원은 Gag 에피토프를 포함한다. 일부 실시양태에서, HIV-1 2-클레이드 집단 에피소드 센서 항원은 Gag의 p24 캡시드 단백질로부터의 에피토프를 포함한다. 일부 실시양태에서, HIV-1 2-클레이드 집단 에피센서스 항원은 Nef 에피토프를 포함한다. 일부 실시양태에서, HIV-1 2-클레이드 집단 에피센서스 항원은 Nef의 보존 부위로부터의 에피토프를 포함한다. 일부 실시양태에서, HIV-1 2-클레이드 집단 에피센서스 항원은 Pol 에피토프를 포함한다. 일부 실시양태에서, HIV-1 2-클레이드 집단 에피센서스 항원은 Pol의 보존 부위로부터의 에피토프를 포함한다. 일부 실시양태에서, HIV-1 2-클레이드 집단 에피센서스 항원은, (1) Gag 에피토프를 포함하는 HIV-1 2-클레이드 집단 에피센서스 항원, 및 (2) Nef 에피토프를 포함하는 HIV-1 2-클레이드 집단 에피센서스 항원을 포함하는 융합 항원이다. 일부 실시양태에서, HIV-1 2-클레이드 집단 에피센서스 항원은, (1) Gag의 p24 캡시드 단백질로부터의 에피토프를 포함하는 HIV-1 2-클레이드 집단 에피센서스 항원, 및 (2) Nef의 보존 부위로부터의 에피토프를 포함하는 HIV-1 2-클레이드 집단 에피센서스 항원을 포함하는 융합 항원이다.

[0049] 일부 실시양태에서, HIV-1 집단 에피센서스 항원은 HIV-1 M-그룹 글로벌 세트에 집중적이다. 일부 실시양태에서, HIV-1 M-그룹 집단 에피센서스 항원은 Gag 에피토프를 포함하고, 서열번호: 718, 서열번호: 720 또는 서열번호: 754의 아미노산 서열을 포함한다. 일부 실시양태에서, HIV- 1 M-그룹 집단 에피센서스 항원은 Gag의 p24 캡시드 단백질로부터의 에피토프를 포함하고, 서열번호: 719, 서열번호: 721 또는 서열번호: 755의 아미노산 서열을 포함한다. 일부 실시양태에서, HIV-1 M-그룹 집단 에피센서스 항원은 Nef 에피토프를 포함하고, 서열번호: 722 또는 서열번호: 724의 아미노산 서열을 포함한다. 일부 실시양태에서, HIV-1 M-그룹 집단 에피센서스 항원은 Nef의 보존 부위로부터의 에피토프를 포함하고, 서열번호: 723 또는 서열번호: 725의 아미노산 서열을 포함한다. 일부 실시양태에서, HIV-1 M-그룹 집단 에피센서스 항원은, (1) Gag 에피토프를 포함하는 HIV-1 M-그룹 집단 에피센서스 항원, 및 (2) Nef 에피토프를 포함하는 HIV-1 M-그룹 집단 에피센서스 항원을 포함하는 융합 항원이고, 여기서 융합 항원은 서열번호: 705 또는 서열번호: 707의 아미노산 서열을 포함한다. 일부 실시양태에서, HIV-1 M-그룹 집단 에피센서스 항원은, (1) Gag의 p24 캡시드 단백질로부터의 에피토프를 포함하는 HIV-1 M-그룹 집단 에피센서스 항원, 및 (2) Nef의 보존 부위로부터의 에피토프를 포함하는 HIV-1 M 그룹 집단 에피센서스 항원을 포함하는 융합 항원이고, 여기서 융합 항원은 서열번호: 706 또는 서열번호: 708의 아미노산 서열을 포함한다. 일부 실시양태에서, HIV-1 M-그룹 집단 에피센서스 항원은 Pol 에피토프를 포함하고, 서열번호: 709, 서열번호: 711, 서열번호: 726 또는 서열번호: 728의 아미노산 서열을 포함한다. 일부 실시양태에서, HIV-1 M-그룹 집단 에피센서스 항원은 Pol의 보존 부위로부터의 에피토프를 포함하고, 서열번호: 710, 서열번호: 712, 서열번호: 727 또는 서열번호: 729의 아미노산 서열을 포함한다.

[0050] 특정 실시양태에서, 개시된 백신은 HCMV 백본 및 가장 잘 매치하는 천연 HIV-1 균주인 것으로 선택된 맞춤형 항원을 포함하는 HCMV 벡터를 추가로 포함할 수 있다. 또 다른 실시양태에서, 개시된 백신은 HCMV 백본 및 가장 잘 매치하는 상이한 HIV-1 균주인 것으로 선택된 맞춤형 항원을 포함하는 HCMV 벡터를 추가로 포함할 수 있다.

[0051] 일부 실시양태에서, HIV-1 맞춤형 항원은 Gag, Pol, Nef, Env, Tat, Rev, Vpr, Vif 또는 Vpu로부터의 에피토프

를 포함한다. 일부 실시양태에서, 맞춤형 항원은 서열번호 692-696; 서열번호. 756-765; 서열번호. 769-777; 또는 서열번호. 780-789로부터 선택된 서열을 포함한다.

[0052] 일부 실시양태에서, HIV-1 맞춤형 항원은 Gag로부터의 에피토프를 포함하고, 서열번호: 692, 서열번호: 693, 서열번호: 694, 서열번호: 695 또는 서열번호: 696의 아미노산 서열을 포함한다.

[0053] 일부 실시양태에서, HIV-1 맞춤형 항원은 HIV-1 M-그룹 글로벌 세트에 집중적이다. 일부 실시양태에서, HIV-1 M-그룹 맞춤형 항원은 Gag 에피토프를 포함하고, 서열번호: 756-765로 이루어진 군으로부터 선택된 아미노산 서열을 포함한다. 일부 실시양태에서, HIV-1 M-그룹 맞춤형 항원은 Gag의 p24 캡시드 단백질로부터의 에피토프를 포함하고, 서열번호: 757, 서열번호: 759, 서열번호: 761, 서열번호: 763 또는 서열번호: 765의 아미노산 서열을 포함한다.

[0054] 일부 실시양태에서, HIV-1 맞춤형 항원은 남아프리카에서 유행성인 HIV-1 C 클레이드에 집중적이다. 일부 실시양태에서, HIV-1 C 클레이드 맞춤형 항원은 Gag 에피토프를 포함하고, 서열번호: 768-777로 이루어진 군으로부터 선택된 아미노산 서열을 포함한다. 일부 실시양태에서, HIV-1 C 클레이드 맞춤형 항원은 Gag의 p24 캡시드 단백질로부터의 에피토프를 포함하고, 서열번호: 769, 서열번호: 771, 서열번호: 773, 서열번호: 775 또는 서열번호: 777의 아미노산 서열을 포함한다.

[0055] 일부 실시양태에서, HIV-1 맞춤형 항원은 미국에서 유행성인 HIV-1 B 클레이드에 집중적이다. 일부 실시양태에서, HIV-1 B 클레이드 맞춤형 항원은 Gag 에피토프를 포함하고, 서열번호: 780-789로 이루어진 군으로부터 선택된 아미노산 서열을 포함한다. 일부 실시양태에서, HIV-1 B 클레이드 맞춤형 항원은 Gag의 p24 캡시드 단백질로부터의 에피토프를 포함하고, 서열번호: 781, 서열번호: 783, 서열번호: 785, 서열번호: 787 또는 서열번호: 789의 아미노산 서열을 포함한다.

[0056] 특정 실시양태에서, 개시된 백신 중 하나의 유효량을 이를 필요로 하는 개체에 투여하는 것을 포함하는, 개체의 HIV-1을 치료하는 방법이 제공된다. 또 다른 실시양태에서, 지리적 영역 내의 다양성을 최적으로 커버하는 백신 항원의 선택은 항원 서열 선택의 에피그래프 방법을 이용하여 생성된 백신 항원 서열을 사용한다.

[0057] 본 발명의 실시양태는 이러한 개시된 백신 중 어느 하나의 유효량을 이를 필요로 하는 개체에 투여하는 것을 포함하는, 개체에서 HIV-1 감염을 치료하는 방법을 포함한다.

[0058] 본 발명의 실시양태는 또한, 하나 이상의 에피그래프 서열을 결정하는 단계, 하나 이상의 에피그래프 아미노산 서열 및 벡터를 포함하고 백신을 제조하는 단계; 및 이를 필요로 하는 개체에 백신을 투여하는 단계를 포함하는, 효과기 기억 T 세포 반응을 유도하는 방법을 포함한다. 다른 실시양태에서, 하나 이상의 에피그래프 아미노산 서열이 서열번호: 697, 서열번호: 698, 서열번호: 699 또는 서열번호: 700을 포함하는, 효과기 기억 T 세포 반응을 유도하는 방법이 제공된다. 이러한 백신은 예방 또는 치료 백신 일 수 있다.

[0059] HIV 백신 연구에서의 최근의 돌파구는 HIV 감염을 예방하기 위해 효과기 기억 T 세포(TEM)를 유도하는 백신의 개념을 포함한다. 종래의 백신 접근법에 의해 유도된 중심 기억 T 세포(TCM)와는 달리, TEM은 림프 조직 및 림프구(extralymphoid) 효과기 부위에서 지속적으로 유지되고, 즉시 항-바이러스 효과기 기능을 매개할 준비가 되어 있으며, 그로써 바이러스 진입 통로(portal) 및 바이러스 재활성 부위에서 일정한 면역 차폐(shield)를 제공한다. TEM을 유발하여 영구적으로 유지하기 위한 가장 적격의 벡터 시스템은 CMV에서 유래한다. 아마도 지속적으로 감염된 세포에서 연속된, 낮은 수준의 재활성화 및/또는 유전자 발현으로 인해, CMV는 T 세포 소모를 유발하지 않으면서 TEM 유지에 필요한 적당한 양의 지속적이고 낮은 수준의 면역 자극만을 유지한다.

[0060] 특정 실시양태에서, 맞춤형 항원 칵테일은 치료 백신 환경에서 사용될 수 있다. 예를 들어, 맞춤형 백신은 HIV와 같이 매우 가변적인 병원체에 감염된 사람들의 집단에서 매우 우수한 커버리지의 에피토프를 제공하는 6-10개의 서열의 정의된 세트에 대해 k-수단(k-means) 클러스터화 전략을 사용할 수 있다. 개체를 감염시키는 바이러스의 서열을 결정할 수 있으며, 2 또는 3개의 감염 바이러스를 가장 잘 커버하는 맞춤형 백신이 전달될 것이다. 에피토프 커버리지는 최적화 될 것인 반면, 백신과 감염 균주 간에 에피토프 불일치는 최소화 될 것이다.

[0061] 제공된 특정 실시양태는 특정 CMV 유전자 부위가 결여된 HCMV 백본 벡터 및 집단 에피센서스 항원을 포함하는 HIV-1 백신을 포함한다. 특정 실시양태에서, HCMV 백본은 UL131a-128 유전자 부위가 결여될 수 있다. 특정 실시양태는, 또한 외피 단백질 pp71 (UL82) 유전자의 결실을 포함할 수 있다. (미국 특허 출원 공보 제2014-0141038호, 제2008-0199493호, 제2013-0142823호 및 국제 출원 공보 제WO/2014/138209호).

[0062] 특정 실시양태에서, 본 발명은 제 2 맞춤형 항원 서열을 포함할 수 있는 백신을 제공한다. 특정 실시양태에서,

백신은 제 2, 제 3 또는 그 이상의 맞춤형 항원 서열을 포함할 수 있다. 에피센서스 항원은 서열번호: 691의 아미노산 서열을 포함할 수 있다. 맞춤형 항원은 서열번호: 692, 서열번호: 693, 서열번호: 694, 서열번호: 695 또는 서열번호: 696의 아미노산 서열을 포함할 수 있다. 일 실시양태에서, 제 1 맞춤형 항원 서열 및 제 2 맞춤형 항원 서열은 서열번호: 692, 서열번호: 693, 서열번호: 694, 서열번호: 695 및 서열번호: 696의 아미노산 서열 중 2 개를 포함한다. 다른 실시양태에서, 제 1 맞춤형 항원 서열, 제 2 맞춤형 항원 서열 및 제 3 맞춤형 항원 서열은 서열번호: 692 서열번호: 693, 서열번호: 694, 서열번호: 695 및 서열번호: 696의 아미노산 서열 중 3 개를 포함한다.

[0063] 또한 서열번호: 692 서열번호: 693, 서열번호: 694, 서열번호: 695 또는 서열번호: 696을 포함할 수 있는 맞춤형 항원 서열을 제공한다.

[0064] 특정 실시양태에서, 개시된 백신은 HCMV 백본 및 가장 잘 매치하는 천연 HIV-1 균주인 것으로 선택된 맞춤형 항원을 포함하는 HCMV 벡터를 추가로 포함할 수 있다. 또 다른 실시양태에서, 개시된 백신은 HCMV 백본 및 가장 잘 매치하는 상이한(그리고 원격의) HIV-1 균주인 것으로 선택된 맞춤형 항원을 포함하는 HCMV 벡터를 추가로 포함할 수 있다.

[0065] 특정 실시양태에서, 개시된 백신의 에피센서스 항원 및 맞춤형 항원은 HIV-1 Gag 단백질로부터 유래될 수 있다. 또 다른 실시양태에서, HIV-1 Gag 단백질은 HIV-1 Gag 단백질의 N-말단에서 미리스토일화 서열을 제거함으로써 불활성화되어 있다. 다른 실시양태에서, 에피센서스 항원 및 맞춤형 항원은 HIV-1 Pol 또는 Nef 단백질로부터 유래될 수 있다.

[0066] 특정 실시양태에서, 개시된 백신 중 하나의 유효량을 이를 필요로 하는 개체에 투여하는 단계를 포함하는, 개체에서 HIV-1을 치료하는 방법이 제공된다. 다른 실시양태에서, 개인에서 HIV-1 바이러스의 서열을 분석하는 단계, 지리적 영역 내의 다양성을 최적으로 커버하도록 고안된 백신 항원을 선택하는 단계 및 백신 항원을 벡터에 삽입하는 단계를 포함하는, 개체에 대해 HIV-1 백신을 고안하고 및 생산하는 방법이 제공된다.

[0067] 특정 실시양태는 이러한 개시된 백신 중 하나의 유효량을 이를 필요로 하는 개체에 투여하는 것을 포함하는, 개체에서 HIV-1 감염을 치료하는 방법을 포함한다.

[0068] 다음의 실시예는 본원에 기술된 실시양태를 보다 상세히 설명하기 위해 제공된다. 이들 실시예는 예시를 위한 것일 뿐이며, 이에 제한되지 않는다.

[0069] 본원에 인용된 모든 문헌, 특허 및 특허 출원은 본원에 참조로서 포함되며, 본 발명의 실시예에 사용될 수 있다.

도면의 간단한 설명

[0070] 도 1a는 Nef 단백질의 CRF01-AE 클레이드에 대한 전체 그래프를 나타낸다. 직사각형은 도 1b에 나타낸 삽입부(insert)이다.

도 1b는 도 1a로부터의 삽입부를 나타낸다. 노드(Nodes)는 회색 점이고, k = 9 인 각각의 k - mer 변형을 나타낸다. 엣지(edges)는 좌측 상단에서 처음 두 에피토프(e_a = VTSSNMNNA(서열번호: 790), e_b = TSSNMNNAD(서열번호: 791))에 대해 나타낸 바와 같이, 2개의 서열이 k - 1 아미노산 만큼 중복되는 에피토프를 연결하는 수평선이다. 그래프의 위상 특성(topological properties)이 노드 위치에 의존하지 않지만, 이 플롯(plot)은 세로축을 사용하여 각 노드에 대한 표적 서열 세트 y = f(e)의 에피토프 빈도를 나타낸다. 수평 위치 x(e) = 1 + $\max_{e' ?(e)} x(e')$, (여기서 ?(e)는 e의 이전 세트임)는 이 플롯에 모든 방향성 엣지(directed edge)가 좌측에서 우측으로 연결되는 특성을 부여한다. 이 그래프의 이상적 경로는 가능한 한 큰 y값을 유지한다. 삽입부는 노드를 통하는 두 가지 경로를 나타낸다. 흑색 실선은 최적의 경로이고, 서열 TSSNMNNADSVWLRAQEEE(서열번호: 792)에 상응하는 반면, 점선은 TSSNMNNADCVWLRAQEEE(서열번호: 793)에 상응한다. 점선은 4개의 노드상에서 더 높은 f(e)값을 달성하지만, 실선은 5개의 노드에 대해 더 높은 f(e)를 달성하며, $\sum f$(e)는 더 높다. x의 모든 값에 대해 최고 값 노드를 포함하는 경로는 존재하지 않음에 주의한다.

도 2는 에피토프 k-문자열(character string)을 나타내는 에피토프 그래프의 노드, 및 정렬된 서열 세트의 그 위치에서 에피토프가 관찰되는 빈도 (f)를 나타내며, 그 노드에서 종료되는 일관된 경로의 누적 최고 점수 S를 나타낸다. 노드는 각 컬럼(column)이 상기 에피토프와 관련된 위치 t에 상응하는 컬럼에 배치된다. 이들 노드를 연결하는 선은 일관성 있는 인접한 에피토프에 상응한다. 목적은, 각 노드의 빈도 값의 합계를 최대화하는 이

그래프를 통해 일관된 경로를 찾는 것이다. 더 굵은 선은 최적의 총점으로 이어지는 하나의 경로를 나타낸다.

도 3은 도 2에 나타낸 바와 같은 초기 해법(q1 = ARCHSLM(서열번호: 794)에 의해 주어짐)으로부터의 노드가 그들의 빈도 값을 0으로 설정하고, 누적 점수 S(t;e)가 이러한 새로운 빈도 노드에 기초하여 재계산됨을 나타낸다. 이는 이러한 보완적인 커버리지 문제에 대한 최적의 해법으로 이어진다: q2 = DEFGKLM(서열번호: 795). 더 굵은 선은 최적의 총점으로 이어지는 하나의 경로를 나타낸다.

도 4a-b는 각각 556개의 위치에 정렬된, 690개의 미국 B 클레이드 Gag 단백질 서열(서열번호: 1-690)과 연관된 에피토프 그래프를 나타낸다. 수평축은 위치 t이고, 노드의 컬럼은 각 위치에서 다른 에피토프를 나타낸다. 노드는 각 위치에서 가장 빈번한 것이 각 컬럼의 맨 아래에 있도록 배열된다. 전체 그래프를 도 4a에 나타내었고, 동일한 그래프의 근접(closed-up) 삽입부를 도 4b에 나타내었다.

도 5a-c는 배제 희귀 변형(excluding rare variants)이 다만 Gag(도 5a), Nef(도 5b) 및 Pol(도 5c)에 대해서만 약간 커버리지를 감소시킴을 나타낸다. 다가 (m=2) 해법의 커버리지는 최소 계수 f_o (즉, 백신에서 가장 희귀한 에피토프 집단 빈도)의 함수로서 나타낸다. 점선은 직접적인 순차 알고리즘에 의해 부여되는 커버리지에 해당하고; 흑색 실선은 100회의 무작위적인 재시작 후의 최상의 해법을 기반으로 한다. 세 개의 모든 플롯에서 세로축은 0.015의 범위로 제한된다.

도 6a-b는 2개 항원 백신의 커버리지를 나타낸다. 치료 백신을 위한 가상의 표적 집단으로 간주 된, 미국에서 단리된 최신의 B 클레이드 서열의 서열당 평균 에피토프 커버리지를 비교하여 나타내었다. 백신 항원으로서 한 쌍의 자연적 클레이드 내 서열을 사용하는 잠재적 T 세포 에피토프(PTE) 커버리지를 나타내기 위하여, 5000개의 무작위로 선택된 자연적 B 클레이드의 서열(회색)의 쌍을 잠재적 백신으로서 평가하였고, 189개의 최신의 B 클레이드 미국 서열의 평균 커버리지 분포를 회색 히스토그램으로 나타내었다. M 그룹 에피그래프(M 데이터베이스)의 2개의 항원 세트, 글로벌 B 클레이드 에피그래프(B 데이터베이스)의 2개의 항원 세트 및 제조용 6개의 대표적인 에피그래프 세트로부터의 2개의 최선의 일치가 189개의 자연적 B 클레이드 미국 서열 각각에 대한 "맞춤형" 일치로서 선택된 미국 B 클레이드 맞춤형 백신에 의해 제공된 평균 커버리지를 비교하였다. 도 6a는 전체 Gag 단백질에 대한 비교를 나타낸다. 도 6b는 보존적 p24 영역만을 비교하여 나타낸다.

도 7은 HIV 단백질체(proteome)에 걸친 잠재적인 에피토프 커버리지의 맵핑을 나타낸다.

도 8은 상이한 백신 항원에 의한 HIV-1 B 클레이드 미국 서열의 평균적 잠재적 Gag 에피토프 커버리지를 나타낸다. 도 8a는 단일 백신 항원에 의한 평균적 Gag 에피토프 커버리지를 나타내고, 도 8b는 백신 항원의 쌍에 의한 평균적 Gag 에피토프 커버리지를 나타낸다.

도 9a-c는 에피그래프로 고안된 합성 HIV 항원이 전장 단백질로서 발현됨을 나타낸다. HeLa 세포를, 하기를 인코딩하는 발현 플라스미드로 형질감염시켰다: 도 9a에 나타낸 바와 같이, HIV 또는 SIV에 대한 gag 및 nef의 융합 단백질 [HIV M 그룹 에피그래프 1(서열번호: 705) 및 HIV M 그룹 에피그래프 2(서열번호: 707), SIVmac239 전장 단백질, SIV 변이체 하이브리드 단백질(서열번호: 713), 및 gag 및 nef(서열번호: 714)의 SIV 보존 부위]; 도 9b에 나타낸 바와 같이, HIV 또는 SIV의 폴리머라제 단백질 [SIVmac239 전장(FL), SIV 변이체 하이브리드 단백질(서열번호: 715), HIV M 그룹 에피그래프 1(서열번호: 709) 및 HIV M 그룹 에피그래프 2(서열번호: 711), 및 pol의 SIV 보존 부위(서열번호: 716)]; 도 9c에 나타낸 바와 같이, HIV에 대한 gag 및 nef의 융합 단백질 [클레이드 B 에피그래프 1 gag/nef(서열번호: 701) 및 클레이드 B 에피그래프 2 gag/nef(서열번호: 702)] 및 HIV에 대한 폴리머라제 단백질 [클레이드 M epi 1 pol(서열번호: 709); 클레이드 B 에피그래프 1 pol(서열번호: 703); 클레이드 B 에피그래프 2 pol(서열번호: 704)]. 모든 gag/nef 작제물은 카르복시-말단 V5 태그(도 9a)를 포함하고, 모든 pol 작제물은 카르복시-말단 HA 태그(도 9b 및 9c)를 포함한다. 도 9b의 경우, 1 및 2는 각 작제물의 다중 클론을 나타낸다. 용해물을 형질감염 이후 48시간째에 수확하였고, V5(도 9a) 또는 HA(도 9b 및 9c) 항체를 사용하여 면역블랏팅 하였다. 관찰된 단백질 분자량은 각각의 작제물에 대해 예측된 분자량과 일치하였다.

도 10a-b는 에피그래프로 고안된 합성 항원이 CMV 벡터에 의해 발현되는 것을 나타낸다. 도 10a에 나타낸 바와 같이, SIVmac 239 폴리머라제 전장(FL)을 발현하는 RhCMV 균주 68-1, 상이한 SIV 변형체(서열번호: 715)로부터의 SIV 폴리머라제 하이브리드, 글로벌 M 그룹 HIV 에피그래프 1(서열번호: 709) 또는 글로벌 M 그룹 HIV 에피그래프 2(서열번호: 711)를 기반으로 하는 합성 폴리머라제 유전자를 BAC 돌연변이 유발을 통해 작제하고, 텔로머화된(telomerized) 레서스 섬유아세포에서 재구성하였다. 도 10b에 나타낸 바와 같이, 폴리머라제 작제물의 SIVmac 239 보존 부위(서열번호: 716)를 발현하는 RhCMV 균주 68-1을 또한 BAC 돌연변이 유발을 통해 구축하고,

텔로머화된 레서스 섬유아세포에서 재구성하였다. 모든 벡터에 있어서, 항원 발현은 내인성 바이러스 Rh107 프로모터에 의해 유도하였다. 세포 펠렛을 전체 CPE에서 수확하고, 각 단백질의 카르복시-말단에서 발현된 HA 태그에 대해 면역블랏팅 하였다. 보존된 pol의 경우, 두 개의 독립적인 클론(2.1 및 2.2)을 도 10b에 나타내었다.

도 11a-c는 Nef(도 11a), Gag(도 11b) 및 Pol(도 11c) 내 보존 부위를 나타낸다. 이는 2가(즉, 2 항원) 백신에 의한 잠재적인 T 세포 에피토프(PTE) 커버리지에 대한 가능성에 기초하여 정의된다.

도 12는 단백질의 보다 가변적인 구역과 비교하며, 상이한 백신 항원에 의한 보존 부위 각각의 평균 에피그래프 커버리지를 나타낸다.

발명을 실시하기 위한 구체적인 내용

[0071] **실시예 1: 정렬된 서열의 최적 에피토프 커버리지를 위한 그래픽 모델**

[0072] 정렬된 서열 N의 세트 S = {s_1, s_2, . . . , s_N}의 존재가 추정된다. 각 서열은 알파벳 문자의 스트링이다(가능하게는 갭, 불명 등과 같은 것에 상응하는 소수의 특수 문자와 더블어, 20개 아미노산에 상응함). 서열이 정렬된 후, 모두는 동일한 길이 T를 가지며, 위치 t= 1 . . . T는 서열에서 서열까지 잘 정의되어 있다; s_n [t]는 n번째 서열의 t번째 문자로서 작성될 것이다. 위치 t에서 시작하고 위치 u에서 끝나는 s 하위서열에 대해 표기법 s[t : u]를 도입하는 것이 유용하다.

[0073] 잠재적 에피토프는 k문자의 짧은 서열, 전형적으로 8 내지 12개 서열로 정의되었다. 관심 에피토프는 S상 서열의 하위서열이다. 실제로, 서열 s는 에피토프의 목록으로 생각할 수 있다: e_1, . . . , e_{T-k+1}, e_t = s[t : t + k - 1]. 그러나, 서열에 관련한 에피토프 목록에 대해서는, 에피토프가 일관된 것일 필요가 있음에 유의해야 한다. 구체적으로, 임의의 인접한 쌍 e_t 및 e_{t+1}에 대해 e_t 의 마지막 k - 1 문자들이 e_{t+1} 의 처음 k - 1 문자들과 일치할 것이 요구된다; 즉, e_t[2 : k] = e_{t+1}[1 : k - 1].

[0074] 각 에피토프 e의 경우에, 빈도 f(e)는 에피토프가 나타내는 S에서의 서열의 분율을 계수하는 것과 관련이 있다.

[0075] 일반적인 칵테일 문제의 경우에, 인위적인 서열 세트 Q = {q_1, . . . , q_M}는 그의 에피토프가 유용한 특성을 갖는 것이 추구된다. E_Q를 Q에서 나타나는 모든 에피토프의 세트라고 설정하자; 즉:

[0076] E_Q = {e / e = q_m [t : t + k - 1]} m, t의 일부 선택의 경우,

[0077] 특히, 이러한 에피토프는 가능한 한 많은 서열 세트 S를 포함하도록 고안되었다. 목표는 커버리지 점수(coverage score)를 최대화하는 것이다.

[0078] $\sum f$ (e) 여기서 합계는 e$\in E_Q$ 를 초과함

[0079] $M < N$ 이고, 전형적으로 $M << N$ 인 경우, 모든 에피토프는 일반적으로 커버될 수 없다.

[0080] 정렬된 서열 과제의 경우, 몇 가지 단순화가 가능하다. 이러한 경우, 정렬내 각 위치는 다른 과제(그러나 독립적이지 않은)로서 처리된다. 빈도 함수는 이제 위치에 의존한다: $f(t, e)$는 e가 t위치에서 시작하는 k-mer 하위서열인 S에서의 서열의 수이다; 즉,

[0081] $f(t, e) = \sum I$ (e = s_n [t : t + k - 1])

[0082] 여기서 I는 지시 함수이다: 그의 인수가 독립변수(argument)가 참(true)인 경우 I는 1이며, 그렇지 않은 경우는 0이다. 세트 E_Q는 또한 서열 q에서 위치에 따라 분할될 수 있다. 따라서:

[0083] E_Q [t] = {e / e = q_m [t : t + k 1] 일부 m의 경우}

[0084] 이는, 각 위치의 커버리지 척도의 생성을 가능케 한다.

[0085] $c[t] = \sum_{e \in Q[t]} f(t,e)$, 이로부터 전체 커버리지가 c = $\sum_t$ c[t]로서 주어짐.

[0086] 간단한 특수 케이스 k = 1의 경우, 에피토프는 단지 아미노산 문자일 뿐이었다. 그러나 과제를 해결하는 것이 단순하다고 하더라도, 해법은 여전히 유용했다. M = 1인 경우, 최적의 해법은 컨센서스 서열(consensus sequence)에 의해 주어지며, q_1 [t]가 위치 t에서 가장 공통적인 아미노산인 것으로 선택된다. M = 2인 경우,

q_2 [t]를 위치 t에서 두 번째로 공통적인 아미노산으로 취함으로써 커버리지를 최적화할 수 있다. 그리고 더 큰 M에 대해서도 마찬가지이다.

[0087] k > 1의 경우, 과제는 에피토프가 중복되기 때문에 단순하지 않으며, 그래서 각 c[t]는 더 이상 독립적으로 최적화될 수 없다. M = 1의 경우, 이것이 추구되었던 에피토프의 컨센서스인 경우를 제외하고, 컨센서스와 같기 때문에 "에피센서스(episensus)" 과제라 불렀다.

[0088] 일 예로, 컨센서스 및 k = 3 에피센서스는 다른 것이다. 컨센서스는 각 위치에서 가장 흔한 문자를 사용하였다. 에피센서스는 가장 흔한 "에피토프"를 사용하였는는데, 본 발명자들은 잠재적 에피토프를 3개 문자의 스트링이라고 부른다. 표 1은 중복되는 에피토프 스트링을 나타내기 위한 이러한 예를 확장한 것이다.

[0089] 표 1: 6개의 서열 및 이와 관련한 k = 3 에피토프를 나타낸다. 맨 아래 줄은 컨센서스 서열(각 위치에서 가장 공통적인 문자로부터 형성됨) 및 각 위치에서 가장 공통적인 에피토프를 나타낸다. 그러나, 이러한 에피토프(특히, EFG 및 CHS)는 서로 모순되는 것이고, 따라서 이들은 단일 에피센서스 해법으로 조합될 수 없다. 이 경우 가장 좋은 에피센서스 점수는 서열에서 가능한 에피토프 30개 중 1 + 1 + 2 + 2 + 3 = 9를 커버하는, 유일하지 않다고 하더라도 서열 ARCHSLM(서열번호: 794)에 의해 주어진다. 컨센서스 ARCGSLM(서열번호: 799)은 1+1+1+1+3=7을 커버한다. 이 점수의 상한선은 각 위치에서 가장 빈번한 에피토프의 빈도로부터 얻을 수 있고, 이러한 경우, 2 + 2 + 2 + 2 + 3 = 11을 제공함에 주목해야 한다.

표 1

[0090]

	서열	토이 에피토프(Toy Epitopes)				
서열번호: 800	ARCGSPM	ARC	RCG	CGS	GSP	SPM
서열번호: 801	ARYGSNM	ARY	RYG	YGS	GSN	SNM
서열번호: 802	AYCHSLM	AYC	YCH	CHS	HSL	SLM
서열번호: 803	YRCHSLM	YRC	RCH	CHS	HSL	SLM
서열번호: 804	DEFGSLM	DEF	EFG	FGS	GSL	SLM
서열번호: 805	DEFGKLM	DEF	EFG	FGK	TKL	KLM

[0091] **에피센서스 과제 해법.** M=1의 경우가 먼저 처리되었고, 여기서 그의 에피토프가 정렬되지 않은 서열 목록 S에서, 에피토프를 최적으로 커버하는 단일 서열 q 가 추구되었다. 적절한 가정하에 에피그래프 알고리즘은 최적의 해법을 달성한다. 비교에 있어서는, 컨센서스 알고리즘(매우 단순하며 빠름)이 또한 고려되었고, 문헌 [Fisher, Nat Med. 2007 Jan;13(1):100-6, 본원에서 참조로서 포함됨]에 기술된 바와 같은 유전자 알고리즘(매우 느림)에 의한 최적화가 고려되었다. 에피그래프 알고리즘은 도 1a 및 1b에 나타나 있다.

[0092] 이후, 백신 과제의 보다 일반적인 칵테일이 M > 1로 고려되었고, 에피센서스 알고리즘이 더 일반적인 이 과제에 대해 어떻게 변형되었는지를 보여주었다.

[0093] 도 2는 에피토프 그래프의 노드(nodes)를 나타내며, 각 노드는 에피토프 k-문자 스트링 및 정렬된 서열 세트의 그 위치에서 에피토프가 관찰되는 빈도(f), 노드에서 종료되는 일관된 경로의 누적 최고 점수 S를 포함한다. 노드는 각 컬럼이 에피토프와 관련된 위치 t에 상응하는 컬럼에 배열된다. 이들 노드를 연결하는 선은 일관되었던 인접한 에피토프에 상응한다. 각 노드에서 빈도 값의 합계를 최대로 하는 이 그래프를 통해 일관된 경로를 찾는 것이 목적이다.

[0094] 도 2의 더 굵은 선은 최적의 총점으로 이어지는 하나의 경로를 나타낸다. 항상 적어도 하나의 이러한 경로가 존재할 것이지만, 유일한 것은 아닐 수 있다.

[0095] 누적 점수 S(t, e)는 t = 1에서 시작하고, 위치 t에서의 에피토프 e에서 종료하여 달성가능한 가장 높은 점수로서 정의되었다. S(t = 1, e) = f(e)이고, t > 1 경우의 값은 재귀적으로 계산할 수 있음이 관찰되었다.

[0096] S(t, e) = f (e) + $\max_{e'}$ S(t - 1, e'), 여기서 e' E(t-1,e)

[0097] E(t - 1, e)는 위치 t에 있는 e와 일치하는 위치 t - 1에서의 에피토프의 세트이다. 모든 에피토프에 대해 이러한 누적 점수를 계산한 결과, 총 점수가 최적의 경로에 대해 마지막 칼럼에서 최대값으로서 나타났다: S_{max} = $\max_e$ S(T - k + 1, e). 또한, 이 최대값으로부터 역방향으로 작업하여 최적의 경로를 찾을 수 있다.

[0098] $e^{*}_{T-k+1} = \text{argmax}_{e}\ S(T-k+1, e)$

[0099] $e^{*}_{t-1} = \text{argmax}_{e'}\ S(t-1, e')$, 여기서 $e' \in E(t-1, e^{*}_{t})$

[0100] 서열 $e^{*}_{1}, e^{*}_{2}, \ldots, e^{*}_{T-k}$ 는 에피토프의 가장 높은 점수의 일정한 서열을 정의하였다. 에피센서스 스트링 q는 각 에피토프로부터 첫 번째 문자를 취함으로써 얻어지며: $q[t] = e^{*}_{t}[1]$, 마지막 에피토프에서 종료한다: $q[T-k:T] = e^{*}_{T-k}[1:k]$.

[0101] 아르그맥스 오퍼레이터(argmax operator)는 고유한 값을 가질 수 없고; 그렇지 않은 경우, 에피센서스 과제에 대한 복수의 해법이 존재할 것이고, 이들 모두는 커버리지의 관점에서 최적이다.

[0102] **갭.** 서열을 정렬하기 위해, 삽입 및 결실이 처리되어야 하고, 이는 정렬된 서열내에 갭을 도입한다. 예를 들어, ARCCDEGH(서열번호: 806) 및 ARCDEFGH(서열번호: 807)의 서열은 ARCCDE-GH(서열번호: 808) 및 ARC-DEFGH(서열번호: 809) 서열로서 더 잘 정렬되었다. 플레이스홀더(Placeholder) 에피토프는 에피그래프 알고리즘에서 이러한 갭을 처리하기 위해 개발되었다.

[0103] **플레이스홀더 에피토프.** $k = 3$ 에피토프는 각각 ARC, RCC, CCD, CDE, DEG, EGH 및 ABC, BCD, CDE, DEF, EFG, FGH이었다; 그러나 에피토프가 첫 번째 컬럼에 정렬되었을 때 그 목록에 갭을 도입할 필요가 있다: ABC, BCC, CCD, CDE, DEG, EGH, -GH 및 ABC, BCD, CDE, -DE, DEF, EFG, FGH. -GH 및 -DE 스트링은 플레이스홀더 에피토프였다. 플레이스홀더는 커버링 함수(covering function)에서 계수되지 않는다. 즉: $f(t; -XY) = 0$. 그러나, 이들은 인접한 에피토프의 일관성을 정의하는데 사용될 수 있기 때문에 여전히 유용하였다.

[0104] 갭이 없는(ungapped) 서열의 경우, 첫 번째 에피토프의 마지막 $k-1$ 문자가 두 번째 에피토프의 처음 $k-1$ 문자와 일치하다면, 2개의 인접한 에피토프는 일치한 것으로 고려되었다. 따라서, ABC와 BCD는 일치하지만, BCC와 CDE는 그렇지 않다. 갭이 도입될 때, 두 번째 에피토프가 갭 문자로 시작되고는 것으로 간주되고, 나머지 $k-1$ 문자가 마지막 에피토프의 마지막 $k-1$ 문자와 일치하면, 이 쌍은 일치한 것으로 고려된다. 따라서, CDE와 -DE는 일치한다.

[0105] 드롭-인-플레이스(drop-in-place) 알고리즘의 경우, 일반적으로 컨센서스 서열로 간주되는 "기질(substate)" 서열을 사용하였다. 그 후, 모든 위치에서 모든 에피토프를 취하였고 얼마나 자주 이들이 나타나는지에 따라 분류하였다. 가장 덜 빈번한 에피토프부터 시작하여, 위치 $[t : t+k-1]$에서 기질의 문자를 에피토프 내의 문자로 대체함으로써 각각의 에피토프를 기질 위에 적하하였다. 가장 빈번하게 발생하는 에피토프가 기질 상에 적하되었을 경우, 스트링을 에피센서스 해법 q로서 사용하였다. 가장 빈번한 에피토프가 보다 희귀한 에피토프를 덮어 쓰기(overwrite) 때문에, 더 높은 에피토프 커버리지가 달성되었다. 그리고 단일 서열 q가 항상 업데이트되기 때문에, 최종 해법은 일관된 에피토프로 구성된다.

[0106] 알고리즘은 일부 에피토프가 동일한 빈도를 가질 수 있기 때문에, 완전히 결정적이지 않을 수 있으며, 이들 위치가 중복될 경우에는 최종 결과가 이들이 적하되는 순서에 좌우될 수 있다. 구현시, 분류 알고리즘이 제공하는 순서가 취해지지만, 이러한 명령을 무작위화하고 알고리즘의 다중 실행을 실시할 기회가 있으며, 일부 실행은 더 높은 점수를 줄 수 있다.

[0107] **경험적(Heuristic) "드롭-인-플레이스" 알고리즘.** 이 알고리즘에서 "기질" 서열은 컨센서스 서열인 것으로 취해지지만, 기질 선택으로 인한 차이는 거의 없었다. 모든 위치에서의 모든 에피토프가 취해지고 이들이 얼마나 자주 나타나는지에 따라 분류하였다. 최소 빈도의 에피토프부터 시작한다.

[0108] 각 에피토프는 위치 $[t : t+k-1]$에서 기질의 문자를 에피토프의 문자로 대체함으로써 기질 위에 "적하된다". 가장 빈번하게 나타나는 에피토프가 최종적으로 기질 위에 적하될 때, 에피센서스 해법 q로서 사용되었던 스트링이 있다. 가장 빈번한 에피토프는, 보다 희귀한 에피토프를 덮어 쓰기 때문에, 더 높은 에피토프 커버리지가 달성되었다. 단일 서열 q는 항상 업데이트 되기 때문에, 최종 해법은 일관된 에피토프로 구성된다

[0109] 알고리즘은 일부 에피토프가 동일한 빈도를 가질 수 있기 때문에 완전히 결정적이지 않을 수 있으며, 만약 그들의 위치가 중복될 경우 최종 결과 n은 이들이 적하되는 순서에 좌우될 수 있다. 구현시, 분류 알고리즘이 제공하는 순서가 취해지지만, 이러한 명령을 무작위화하고 알고리즘의 다중 실행을 실시할 기회가 있으며, 일부 실행은 더 높은 점수를 줄 수 있다. 이러한 무작위화된 다중-실행 접근의 유용성은 보고된 바 없다.

[0110] 해법은 각 위치에서 가장 빈번한 에피토프에만 의존하고, 따라서 표 1의 예시는, DEF, EFG, CHJ, HJL, JLM의 일관된 조합일 것이다. 만약 이들이 그 순서(처음 4개는 빈도 2, 마지막 하나는 빈도 3)로 적하된다면, 점수 0+0+2+2+3=7이 컨센서스를 능가하지만 최적에 미치지 못하는 DECHJLM(서열번호: 810)이 얻어진다. 만약, HJL, CHJ, EFG, DEF, JLM의 순서로 적하된다면, DEFGJLM(서열번호: 811)는 상기 예시에 대한 최적 점수인 2+2+1+1+3=9의 점수를 얻을 것이다. 이러한 두 가지 해법이 도 3에 나타나 있다.

[0111] **백신 (M > 1) 과제의 정렬된 칵테일.** 유전적 알고리즘 최적화를 이용하는 본래의 모자이크 해법에 있어서, 모자이크 서열의 모든 M은 동시에 최적화된다.

[0112] **순차적 해법.** $M = 1$ 에피센서스 해법을 $M > 1$인 과제로 확장하는 한가지 방법은, 보완적 커버리지를 최적화하기 위해 전체 커버리지를 최적화하기 위해 알고리즘을 변형하는 것이다. 즉, 에피센서스 해법 q_1이 주어지면, q_1으로 커버되지 않는, 나머지 에피토프를 가능한 한 많이 커버하는 q_2를 찾는다.

[0113] **순차적 해법의 반복적인 보정.** 초기 해법 $q_1, q_2, \ldots, q_M$이 주어지면, q_1에 대한 새로운 추정이 재계산될 수 있다. 이는 각각의 에피토프에 대한 본래 빈도 값으로 시작하지만, $q_2, \ldots, q_M$에 의해 커버되는 그러한 에피토프를 제로로 설정함으로써 이루어진다. 이러한 보완적 커버리지 과제의 최적화는 새로운 q_1으로 이어진다. 이 방식으로 모든 초기 해법을 반복할 수 있으며(loop through), 매번 보완적 커버리지를 최적화한다.

[0114] **오프-바이-원 스코어링(Off-by-one scoring).** 지금까지 나타난 분석은, 서열 s의 에피토프가 서열 q의 에피토프와 정확히 일치할 경우에만, 커버리지에 대한 신뢰도를 제공한다. 그러나, 특히 더 긴 에피토프, 예를 들어, $k = 12$의 경우, 서열 중의 에피토프가 대강 일치한다면 이는 여전히 유효할 수 있다. 예를 들어, 12개 중 11개의 문자에서의 일치는 만족스러운 커버리지를 구성할 수 있다.

[0115] **결과.** 이러한 알고리즘은 690개 서열의 데이터세트를 사용하여 비교하였다.

[0116] 도 4는 이러한 대규모 데이터세트에 대하여 그래프가 어떻게 보여지는지를 나타낸다. 도 4는 각각 556개의 위치에 정렬된, 690개의 미국 B-클레이드 Gag 단백질 서열(서열번호: 1-690)의 데이터세트와 관련된 그래프를 나타낸다. 결과를 표 2에 나타내었다. 수평축은 위치 t이고, 노드의 컬럼은 각 위치에서 다른 에피토프를 나타낸다. 노드는 가장 빈번한 것이 아래로 가도록 배열하였다. 노드 및 엣지(근접 노드의 일관성을 나타냄)를 나타내었다. 전체 그래프를 (a)에 나타내었고; 동일 그래프의 클로즈-업 삽입부를 (b)에 나타내었다.

[0117] 표 2는 커버리지의 점수 비교를 나타내는데; 이는 백신 서열 $Q = \{q_1, \ldots, q_M\}$에서의 에피토프에 의해 커버되는(완벽히 일치) 서열 S에서의 에피토프 ($k = 12$) 분율이다.

표 2

[0118]

Algorithm	에피센서스(M = 1)	M = 2	M = 3	M = 6
Consensus	0.5070	-	-	-
Genetic Algorithm	0.5072	0.6098	0.6643	0.7308

[0119] 글로벌 에피그래프 해법의 경우, Gag, Pol 및 Nef에 대한 2가 백신에 대해 상보적인 2nd 에피그래프 서열뿐만 아니라, M 그룹, B 클레이드 및 C 클레이드 데이터베이스 서열(2015년경까지 포함)에 근거하여, 단일의 최적 에피그래프 서열을 결정하였다. 모자이크 디자인 대비 에피그래프 코드의 새로운 이점은, 새로운 서열의 디자인에 포함된 특징인 희귀한 에피토프의 의도적 배제를 허용한다는 것이며, 하기 도면에서는 M 그룹으로부터의 희귀한 변형체를 배제하는 경우의 영향에 대한 예시를 보여준다. 도 5a-c는 사용된 에피그래프 및 맞춤형 백신의 최종 값을 나타낸다.

[0120] **실시예 2: 정렬되지 않은 서열의 최적 에피토프 커버리지를 위한 그래픽 모델**

[0121] 표적 집단(예를 들어, 계통발생적 클레이드, 국가 또는 세계 전역)에 걸쳐 바이러스의 가변성을 특징화하기 위해, 정렬되지 않은 단백질 서열 N의 세트 $S = \{s_1, s_2, \ldots, s_N\}$를 취한다. 잠재적 에피토프는 k 아미노산(전형적으로는 k = 9)의 하위서열이다. 각각의 잠재적 에피토프 e는, e가 나타내는 S내의 서열의 수에 상응하는 정수 빈도 $f(e)$로 할당된다. 1가 과제는 자연 단백질과 유사하지만 집단 S의 잠재적 에피토프를 최적으로 커버하는 단일 인공 서열 q를 고안하는 것이다. q에 나타나는 에피토프 세트로서 E(q)를 기재하는 경우, 본 발명의 커

버리지는 다음과 같이 측정된다.

[0122] 커버리지(q) = $\sum_{e\in E(q)} f(e) / \sum_{e\in E(s)} f(e)$

[0123] 분자는 q에 나타나는 에피토프 빈도의 합이며, 분모는 S내의 임의의 서열에 나타나는 모든 에피토프에 대한 합으로 정규화한다. 이 공식은 방향성 그래프로 표현될 수 있다. 그래프의 각 노드는 별개의 에피토프 e에 상응하며, 방향성 엣지는 k-1 문자에 의해 에피토프가 중복되는 경우 두 개의 길이-k 에피토프 (e_a; e_b)를 연결한다. 그래프를 통한 경로는 i = 1, . . . , L-1에 대해 e_i에서 e_{i+1}까지의 엣지를 갖는 노드 e_1, e_2, ..., e_L의 서열이다. 이러한 경로는 인공 항원 q인, L + k - 1 문자의 서열에 상응한다.

[0124] 이러한 방향성 그래프에 사이클이 없는 경우, 에피그래프는 커버리지를 엄격하게 최대화하는 그래프를 통과하는 경로를 찾아, 최적의 해법을 제공한다. 또한, 이러한 최적화는 그래프의 크기(노드와 엣지에서 측정된 바와 같음)에 단지 선형적으로 비례하는 계산 작업으로 수행된다. 실제로,특히 큰 값의 k의 경우에는 거의 자주 그러하다고 하더라도 S로부터 작성된 방향성 그래프는 비순환적이지 않을 수가 있다. 이러한 경우, 그래프는 순환을 반복적으로 식별하고 순환 남아 있지 않을 때까지 값이 낮은 엣지를 제거하여 "탈-순환(de-cycled)"된다.

[0125] m > 1 항원의 다가 "칵테일"은, 에피그래프를 하순차적으로 실행하고 상보적 에피토프 커버리지를 최적화함으로써 생성될 수 있다. 이는 첫 번째 항원에 포함된 에피토프 e를 이들의 빈도가 0인 것처럼 처리하고, 그 후 이들 수정된 빈도에 대해 에피그래프를 실행하여 달성된다. 첫 번째 항원의 임의의 에피토프가 경로를 완료(완전한 단백질을 생성)하는데 요구되는 경우, 이들을 여전히 사용할 수는 있지만, 이들이 더 이상 커버리지 점수에는 기여하지 않으므로 선호되지 않을 것이다. 이러한 순차적 해법은 반복적 보정을 이용하여 개선될 수 있다.

[0126] **실시예 3: 맞춤형 치료 백신**

[0127] 각각의 개체에 대해 디자인된 백신을 구축하는 것은 실현 가능하지 않지만, 백신 옵션의 작은 기준 세트 내에서 우수한 매치를 얻고자 시도하기 위해 그 개체의 바이러스의 서열을 분석하는 것은 실현 가능하다. 첫 번째로 고려 사항은 Gag 단백질에 초점을 맞춘 미국 기반 B 클레이드 시험 집단(trial population)이었다. 남아프리카 기반 기준 백신 세트와 글로벌 백신 세트가 고안되었고, 미국 기반의 B 클레이드 고안도 업데이트되었다. p24는 Gag에서 가장 고도로 보존된 서브-단백질이고, 길이가 약 230개 아미노산인 보존 부위를 제공하기 위해 보다 큰 Gag 단백질로부터 절단될 수 있다. 또한, 보존 부위 접근법은 어쩌면 Nef의 보존 스트레치(stretch)와 다른 관심 단백질을 비롯해, 아마도 Gag와 Pol의 부위에 초점을 맞추는 Gag의 대안으로 생각되었을 것이다.

[0128] 이는 예방 백신에 대한 최적의 집단 커버리지를 제공하는 세트를 고안하기 위한 시도와는 매우 다른 최적화 과제이다. 예방의 경우, 어떤 바이러스가 백신 접종자와 대면하게 되는지는 알려져 있지 않다. 치료의 경우, 감염 바이러스 서열을 수득하고 매치시킬 수 있다.

[0129] 최적화는 두 가지를 고려하여 실시하였는데: 첫째, 개체의 감염 바이러스와의 일치를 최대화하고, 둘째, 불일치를 최소화하여 백신 반응이 관련 에피토프에서 가능한 한 표적이 되도록 하는 것이다.

[0130] HIV 주요 클레이드 내의 계통발생은 거의 명확한 구조를 갖지 않는 경향이 있다. 오히려 그것은 매우 긴 외부 브렌치(branch)와 기지 근처의 매우 짧고 거의정의되지 않은 내부 브렌치를 가진 "스타바스트(starburst)"이다. 이 구조의 일부는 서브타입-내 재조합 때문으로 보인다. 정량화하는 것이 어려운 반면, 재조합은 확실히 상대적으로 빈번히 발생하며, 서브타입-내 재조합의 관점에서 보여지는 것에서 유추해 보면, 광범위할 것 같다. 트리 구조를 고려하면, 가능한 백신의 기준 세트를 정의하기 위해 계통수 상의 클러스터화를 이용하는 것만으로는 "에피토프 관점"에서 클레이드-내부(sithin-clade) 연합이 제한된 의미를 지니기 때문에 효과적이지 않을 것이다. 대신, 서열 관계는 관련된 측정에 의해 고려되어야 하고, 기준 세트는 천연 균주와 추정 백신 디자인 사이의 잠재적 에피토프 유사성에 기초하여 선택되어야 한다.

[0131] class II 에피토프를 고려하여 12-mer가 최적화되었지만, 코드는 임의의 길이의 k-mer를 기준점으로 사용할 수 있으며, 여기서 k는 추정되는 잠재적 에피토프의 길이이다. 9-mer가 또한 사용되었다. 모자이크를 사용한 과거의 연구에서, 9-mer에 대한 최적의 해법은 근처의 다른 길이 (8, 10, 11, 12)에 대해 거의 최적이었으며, 본원에서 기술된 새로운 알고리즘으로 이어질 것으로 예상된다. 본원에서 기술된 특정 맞춤형 백신 세트에 9-mer를 사용하였다.

[0132] 최적성(optimality)은 k-mer 커버리지에 관하여 정의된다. 이것은 각 서열을 "에피토프의 백(bag)" 즉, 서열에 나타나는 모든 k-mer의 비순서화(unordered) 목록으로 대체함으로써 정의된다. 에피토프의 백은 세트 내 임의의

서열에 나타나는 모든 *k*-mer의 목록을 작성함으로써 서열 세트에 대해 정의 될 수 있다. 서열 세트 Q = {q_1, q_2, . . . , q_N} 에 의한 주어진 서열 S의 커버리지는, Q서열의 집단적 백(collective bag) 내에도 있는 S의 백 내 에피토프의 분율에 의해 주어지고, 여기서 Q는 백신 칵테일 내의 다가 조합일 수 있다. 이 커버리지는 최적화되었다. 다른 관심 양은 S-백에는 없는 Q-백 내의 에피토프 분율이었다. 비록, (현재는)최적화에 직접적으로 사용되지는 않지만, 이러한 이질적인(extraneous) 에피토프의 더 작은 부분이 선호되며, 이러한 수는 비교 및 실험적 고안을 위해 계산된다.

[0133] "중심 서열(central sequence)"을 찾는 6가지 방법이 맞춤형 백신 분석 코드내로 통합된 맞춤형 백신에 대한 클러스터화를 수행할 때 평가되었다(아래 참조). 에피그래프 해법이 최선으로 간주되었고, 최종 코드로 사용되었다. 몇 가지 클러스터화 전략도 시도되었다.

[0134] 다음은 클러스터의 아미노산 기반 중심 서열을 정의하기 위해 시험된 전략이다:

[0135] **1) 컨센서스(Consensus):** 컨센서스는 정렬(alignment)에서 가장 공통적인 아미노산을 연결함으로써 수득된 공통의 기준이다.

[0136] 잠재적 에피토프 (*k*-mer) 기반:

[0137] **2) 에피센서스(episensus):** 이 접근법은 집단 내 또는 클러스터 내의 단일 중심 서열을 해결한다. 에피센서스를 찾기 위해 두 개의 알고리즘을 시험하였다. 첫 번째는 드롭-인-플레이스(drop-in-place) 알고리즘이다. 이것은 컨센서스를 "기질"로 하여 시작한다. 매우 희귀한 *k*-mers (집단 내 1회만 발견되는 것들)를 제외하고, 희귀한 저빈도 변형체로 시작하여 컨센서스 *k*-mers를 희귀한 변형체로 대체한 다음, 변형체로의 대체를 유지하고, 이들의 빈도에 근거하여 모든 *k*-mer의 목록 전체에 걸쳐 증가하고(going up) 가장 빈번한 변형체가 "고정된(standing)" 상태가 될 때까지, 더 빈번한 변형체로 대체하거나 중복시킨다; 더 높은 빈도로 중복되는 *k*-mer는 자연적으로 더 낮은 빈도로 중복되는 펩타이드를 오버라이드(override)하는 경향이 있을 것이다. 두 번째 알고리즘은 에피그래프이며, 실시예 1에 기술되었다. 에피그래프 서열은 GA 모자이크보다 더 빨리 계산되므로 맞춤형 백신을 고안하는데 필요한 클러스터화 알고리즘 내로 쉽게 통합된다. Gag 단백질을 포함하는 556 개 아미노산의 정렬된 서열 690개 세트(서열번호: 1-690)를 이용한 실험에서, 에피그래프 해법은 컨센서스에 매우 근접하였으며, 다른 두 개의 중심(centroids)과 단 하나의 아미노산 차이를 가지는, 가장 우수한 단일 모자이크에 매우 근접하였다.

[0138] **3) 순차(Sequential):** 이 접근법은 백신 옵션 서열 *N*의 세트를 해결한다. 여기에서 에피센서스가 집단에 대해 먼저 정의되었고, 이는 q_1이다. 다음으로, 이미 q_1에 의해 커버된 모든 *k*-mer가 제외되고, 접근법은 q_2를 얻기 위해서, 동일한 드롭-인-플레이스(drop-in-place) 과정에 의해 시리즈 내 두 번째 서열을 해결한다. 그런 다음 q_1과 q_2로 이미 커버된 모든 *k*-mers가 제외되고, 접근법은 잠재적 에피토프의 더 희귀한 버전을 각각 포함하는 서열 *N* 세트에 대해 해결될 때까지 계속 반복하여 q_3을 해결한다.

[0139] **4) 반복(Iterative):** 이것은 순차적 알고리즘의 반복적 버전이다. 이는 또한 일반적으로 순차적 접근법보다 우수한 커버리지를 갖지만 순차 알고리즘이 생성하는 우선 순위는 수반하지 않는, 백신 옵션 서열 *N*의 세트를 생성한다. 순차적 해법 q_1, q_2, . . . , q_N으로 시작하여, 데이터 서열 세트 내에 있는 모든 에피토프를 식별하고, 그런 다음 q_2, . . . , q_N으로 커버된 에피토프가 제외된다. 남은(제외되지 않은) 에피토프를 사용하여 에피센서스를 해결함으로써, q_1에 대한 새로운 값이 얻어진다. 다음 단계는 q_1, q_3, . . . , q_N의 에피토프를 제외하고, q_2와 동일한 작업을 수행한다. 또한 q_3에서 q_N까지 계속된다.

[0140] **5) 모자이크(GA 모자이크):** 원래의 유전적 알고리즘(GA)을 사용하여 정의된다. 모자이크는 GA에 의해 생성된 모자이크 및/또는 항원 서열이라 불리는 유전적 알고리즘을 지칭한다. 여기에서, 크기 N의 모자이크 세트를 한 번에 모두에 대해 해결하거나, 최상의 단일 모자이크를 고정하고 총 6개의 백신 옵션 서열을 만들기 위해 5개의 상보적 세트에 대해 해결할 수 있다. 이 전략은 아래에 기술된 클러스터화 전략과 직접적인 비교를 가능하게 하기 위해 채택되었다.

[0141] **6) 최상의 천연(Best natural):** 이 접근법은 백신 옵션 서열 *N*의 세트를 해결한다. 가장 "에피토프 집중"인, 즉 가장 공통된 *k*-mer를 가지는, 세트 내의 천연 균주가 동정된다. 이를 규명하기 위해, 주어진 천연 균주의 모든 *k*-mer에 대해, 빈도를 집단 내 그의 빈도에 기초하여 특정의 형태로 할당할 수 있고, 그런 다음 천연 균주가 집단을 얼마나 잘 커버하는지의 척도로서 빈도를 합한다. 가장 높은 점수를 가진 천연 균주가 최적의 단일 균주

Nat.1이다. 그런 다음, Nat.1에 의해 커버되는 *k*-mers는 평점표로부터 제거될 수 있고, Nat.2에 대한 최상의 보완은 이미 Nat.1에 의해 커버된 에피토프를 제외하고는 에피토프 커버리지에 대해 최상의 천연 균주를 발견함으로써 선택될 수 있다. 이것은 반복적으로 이루어지므로 *k*개의 천연 균주가 선택되고, 여기서 *k*는 고려하고자 하는 백신 옵션의 수이며, 이들은 Nat.1이 최적의 단일 균주이고 Nat.2가 Nat.1의 최상의 보완이고, Nat.3이 (Nat.1 + Nat.2)의 최상의 보완이 되도록 순서화된다.

[0142] 집단 커버리지를 최적화하기 위해 과거에 고안되었던 치료 백신 집단 서열을 특이적으로 처리하기 위한 새로운 아이디어를 비교하여, 이하의 일반적 전략에 따라 고안된 백신 옵션을 탐구하였다.

[0143] 모든 개체가 동일한 백신을 받게 되는 경우(이는 보존 부위에서만 더 효과가 있을 수 있음), 서열 분석 및 맞춤화(tailoring)가 이루어지지 않는다. 이는 각 개인에 대한 최적화가 아닌, 보편적인 고안이다:

[0144] 컨센서스: 집단을 가장 잘 커버하는 단일의 보편적 서열을 찾는다. 이러한 1-보편적 서열의 후보로는, 집단 컨센서스, 최상의 단일 GA 모자이크, 에피센서스, 및 가장 "에피-중심적(epi-centric)" 천연 균주가 포함된다

[0145] 에피그래프: 2 또는 3 개의 집단 기반 서열을 찾고, 이를 집단 내 모두에 부여한다. 이 집단 기반 전략을 GA 모자이크, 최상의 천연 균주 및 순차적이고 반복적인 모자이크 해법을 사용하여 비교하였다. 에피그래프가 현재 사용 가능하고, 희귀한 에피토프를 제외할 수 있는 바와 같이, 모자이크보다 개선되었으므로, 본 발명자들은 에피그래프를 사용한다.

[0146] 반대로, 맞춤형 백신의 경우, 각 개인은 그 또는 그의 감염에 가장 잘 일치하는 백신 서열만을 받게 될 것이다: 예를 들어, 6개의 백신 항원 서열을 제조하고, 환자에게 전달하기 위해 최선의 하나, 또는, 그를 6개 중에서 2개 또는 3개의 최선의 조합을 선택한다; 즉, 가장 적은 불일치 에피토프를 가지면서 환자가 감염된 균주에 대해 최선의 커버리지를 제공하는 것을 선택한다. 이러한 시나리오를 위해 몇몇의 전략을 탐구하였다.

[0147] **a. k-수단-유사 전략(k-means-like strategy)을 이용한 클러스터 서열** 6개의 클러스터를 생성하기 위해, 최종 세트에 대해 1500번의 반복을 실시하였고(이러한 각각의 반복은 몇 차례의 정기적 반복을 통해 시험 분할 및 병합(trail split-and-merge) 관계였음), 백신 세트에 대한 이들 6개의 클러스터로부터 중심 서열을 정의하였다. 두 서열 사이의 거리는, 다른 서열에 의한 에피토프 하나의 서열의 커버리지를 공제한 것으로 정의한다. 초기에, 6개의 무작위적으로 선택된 천연 균주를 클러스터를 입력하기 위해(to seed) 사용하였다. 이는 관련성이 매우 높은 6개의 중심 서열 세트를 제공한다. 보다 자연적 다양성이 표현되었다면, 이는, 맞춤형 백신을 만들기 위한 더 우수한 시약 세트를 만들 것으로 결정되었다. 다음으로, 6개의 클러스터는 이들이 매우 가변적이기 때문에 가장 보완적인 6개의 천연 균주(Nat6)가 입력되었고(seeded), 그 후에 에피센서스로서 클러스터를 기준으로 클러스터를 재할당하고, 반복적으로 다시 클러스터를 형성하고 다시 중심에 배치하였다. 이 전략은 6개의 최상의 천연 균주로 시작하는 것과 에피센서스 대신 클러스터의 중심으로 컨센서스를 사용하는 것을 비교하였고, 에피센서스는 약간 더 우수한 커버리지를 제공하였다. 최소 클러스터 크기의 시행 역시 약간 더 우수한 커버리지를 제공하여(최소 클러스터 크기로 1, 5 및 20을 시험하였음), 최소 클러스터 크기가 제약조건으로 포함되었다. 최소 크기 20이 1 또는 5보다 더 우수하였다. 최소 크기를 구현하기 위해, 주어진 사이클에서 클러스터 크기의 서열 수가 최소 크기가 되면, 이러한 "너무 작은 클러스터"의 멤버가 다른 다섯 개 클러스터로부터의 가장 좋은 중심에 각각 재할당된다. 잃어버린 클러스터를 대체하기 위한 새로운 클러스터를 만들기 위해 그 중심에서 가장 큰 평균 거리를 가진 클러스터를 클러스터 내에서 2개의 무작위 천연 서열을 중심으로 취하고, 이들에 대해 두 개의 클러스터를 개선하여 중심을 다시 계산하고, 이러한 새로운 6개 클러스터로 다음 단계로 진행함으로써 분할하였다. 이러한 클러스터의 중심은 계통수의 중심에 매우 근접하였다. 이 결과가 신호를 지배하는 클러스터 내의 반복적인 컨센서스의 복제로 인한 것임이 이 서열로부터 결정되었다.

[0148] **에피센서스 + (5개의 클러스터 중심).** 여기에서, 중심 서열이 에피그래프 알고리즘(집단 에피센서스)을 사용하여 전체 집단에 대해 먼저 정의하였고, 백신 시약으로 포함되도록 고정하였다. 집단 에피센서스에 일치하는 임의의 에피토프를 클러스터화의 고려사항에서 배제하였다. 서열을 최소 크기로 이전과 같이 클러스터 화 하지만, 이번에는 에피센서스에서 발견된 것 이외의 모든 잠재적 에피토프에 근거한 5개의 클러스터를 합성하여, 집단 에피센서스에 상보적인 클러스터를 표적하였다. 이는 Gag에 대한 최상의 해법으로 판단되었다. 각 개체의 맞춤형 백신에 집단 에피센서스를 포함시킴으로써, 주어진 가장 일반적인 k-mer가 이들의 표본 HIV 서열에서 분명하지 않은 경우에도, 일반적인 형태 사이의 HIV의 빈번한 아미노산 토글링(toggling)을 가정하면, 이는 잠복해 있을 수 있거나 역행(reversion)을 위한 일반적인 형태일 수 있다. 5개의 클러스터 중 하나로부터의 제 2 상보성 서열이 백신과 감염 균주 사이의 변형체 교차-반응 잠재력에 추가될 수 있다.

[0149] c. 최상의 에피그래프를 고정하고, 5개의 모자이크 보완을 추가하여 6개 세트(추가된 5개는 순서 없음)를 얻거나, 최상의 천연을 고정하고 5개의 천연 균주를 연속하여 추가한다.

[0150] 광범위한 비교 및 보정 이후, 본 발명자들은 맞춤형 백신에 대한 클러스터의 중심을 정의하기 위해, 에피그래프 알고리즘의 사용을 선호하였다. 글로벌 M 그룹 백신, 최신의 B 클레이드 백신, 및 남아프리카에 대한 최신의 C 클레이드 백신을 표적한, 맞춤형 디자인 제조용 6개의 Gag 단백질 항원 세트를 제공하였다. 2개의 천연 B 클레이드 서열, M 그룹 에피그래프, B 클레이드 에피그래프 또는 B 클레이드 맞춤형을 이용하고 천연의 최신의 B 클레이드 서열의 커버리지 비교 결과를 6a-b에 나타내었다; B 클레이드 맞춤형 디자인이 최상의 에피토프 커버리지를 제공한다.

[0151] 다양한 시나리오가 M, C, T, A 및 P로 표기된 표 3에 나타낸 바와 같이 몇 가지 수로 요약될 수 있다. 이들은 각 카테고리의 "알약(pills)"(즉, 백신 항원)의 수에 관하여 이하에서 기술한다.

[0152] M = 제조된, 생성된 알약의 총 개수, 그로부터 각 개인별로 일부 아집단이 선택됨. 전형적으로 M = 6 이하로 가정함.

[0153] C = 공통, 모든 사람들이 받는 알약, 아마도 일부 맞춤형 알약에 추가함.

[0154] T / A = 맞춤형/대체약품(Tailored / Alternatives), T는 각 개인에게 제공되는(대체약품 중의) 맞춤형 알약의 수, 아마도 일부 통상적인 알약과 병용됨.

[0155] P = 개체당 총합(T + C), 각 개인에게 제공되는 알약의 수.

표 3

[0156]

중심	**P**	**C**	**T/A**	**M**	**COVER**	**EXTRA**	**DELTA**
					>good	>bad	>good
공통: 모든 사람이 동일 집단 기반 백신을 받음:							
Consensus	1	1	0/0	1	0.5070	0.4913	0.0157
1-GA Mosaic	**1**	**1**	**0/0**	**1**	**0.5072**	**0.4911**	**0.0161**
Episensus	1	1	0/0	1	0.5065	0.4918	0.0147
Natural	1	1	0/0	1	0.4793	0.5191	-0.0398
2-GA Mosaic	2	2	0/0	2	0.5960	0.6692	-0.0732
2-iterMosaic	**2**	**2**	**0/0**	**2**	**0.5965**	**0.6346**	**-0.0381**
2-Natural	2	2	0/0	2	0.5473	0.6584	-0.1110
3-GA Mosaic	3	3	0/0	3	0.6346	0.7424	-0.1078
3-iterMosaic	**3**	**3**	**0/0**	**3**	**0.6534**	**0.7190**	**-0.0656**
3-seqMosaic	3	3	0/0	3	0.6429	0.7119	-0.0690
3-Natural	3	3	0/0	3	0.5941	0.7308	-0.1367
6- iterMosaic	6	6	0/0	6	0.7205	0.8324	-0.1119
1+5-GA Mosaic	6	6	0/0	6	0.7048	0.8241	-0.1193
6-Natural	6	6	0/0	6	0.6628	0.8104	-0.1476

[0157] 표 3에서, 단일 밑줄의 숫자는 천연 서열에서 12-mer의 평균 > 60% 가 백신 에 의해 커버됨(GOOD)을 나타내는 반면, 이중 밑줄의 숫자는 평균적으로 12-mer의 70% 초과가 천연 균주에 존재하지 않음을 나타낸다.

[0158] **맞춤형-690개 집단 서열 각각에 대한 6개 중 최상의 1개 선택:** 전체 집단에 대해 단 하나만 만드는 것이 더 나을 것은 없지만(0.54 대 0.51), 6개의 백신이 만들어지면 C6-epi6가 최상의 클래스이고, 6개 중 하나를 그들의 서열에 따라 개체에 제공한다.

C6-epi	**1**	**0**	**1/6**	**6**	**0.5366**	**0.4616**	**0.0750**
1+5-Epi-C5	1	0	1/6	6	0.5079	0.4904	0.0175
1+5-GA Mosaic	1	0	1/6	6	0.5083	0.4900	0.0183
1+5-iterMosaic	1	0	1/6	6	0.5074	0.4909	0.0165
6-iterMosaic	1	0	1/6	6	0.3979	0.6008	-0.2029
6-Natural	1	0	1/6	6	0.4863	0.5122	-0.0259
C6-NaturalSeed	1	0	1/6	6	0.5291	0.4692	0.0599

[0159]

[0160] 6개 그룹으로부터의 맞춤형 최상의 쌍

C6-epi	2	0	2/6	6	0.5785	0.5313	0.0472
1+5-Epi-C5	**2**	**0**	**2/6**	**6**	**0.6255**	**0.6310**	**-0.0055****
6-interMosaic	2	0	2/6	6	0.5552	0.6859	-0.1307
6-seqMosaic	2	0	2/6	6	0.6075	0.6331	-0.0256
1+5-GA Mosaic	2	0	2/6	6	0.5932	0.6401	-0.0469
6-Natural	2	0	2/6	6	0.5759	0.6431	-0.0672

[0161]

[0162] **하이브리드 맞춤형 쌍:** 집단 중심을 고정하고, 테스트 서열의 각각을 커버하기 위해 고정된 서열을 최상으로 보완하도록 5개 중 1개 중심을 추가

1+5-Epi-C5	2	1	1/5	6	0.6255	0.6310	-0.0055**
1+5-GA Mosaic	2	1	1/5	6	0.5922	0.6394	-0.0472
1+5-Natural	2	1	1/5	6	0.5724	0.6395	-0.0671
6-seqMosaic	2	1	1/5	6	0.6071	0.6330	-0.0259
6-iterMosaic	2	1	1/5	6	0.5280	0.7039	-0.1759

[0163]

[0164] **최상의 3개 하이브리드**- 집단 중심을 고정하고, 5개 중 2개 중심을 고정 서열에 최상으로 보완하여 테스트 서열을 커버함

1+5-Epi-C5	**3**	**1**	**2/5**	**6**	**0.6590**	**0.6868**	**-0.0278**
HBP-6-iterMosaic	3	1	2/5	6	0.6586	0.7079	-0.0493
HBP-1+5-GA Mosaic	3	1	2/5	6	0.6447	0.7155	-0.0708

[0165]

[0166] **공통:** 모두가 동일한 집단-기반 백신을 받고, 1 또는 2개 백신 항원이 전달됨:

Common	Natural	1	1	0.4793	0.5191
Common	Mosaic	1	1	0.5072	0.4911
Common	2-Natural	2	2	0.5473	0.6584
Common	2-GA Mosaic	2	2	0.5960	0.6692
Common	2-iterMosaic	2	2	0.5965	0.6346
Tailored	C6-epi	2	6	0.5785	0.5313
Tailored	**1+5EpiC**	**2**	**6**	**0.6341**	**0.6361**
Tailored	1+5EpiC5	3	6	0.6590	0.6868
Common	3-GA Mosaic	3	3	0.6346	0.7424

[0167]

[0168] 완벽 일치 **1+5-Epi-C5:**

	Optimized for 9		Optimized for 12	
	COVER	EXTRA	COVER	EXTRA
Evaluated for 9	0.7098	0.5744	0.7066	0.5535
Evaluated for 12	0.6301	0.6525	**0.6341**	**0.6361**

[0169]

[0170] 오프-바이-원은 일치를 고려하였음 **1+5-Epi-C5:**

	Optimized for 9		Optimized for 12	
	COVER	EXTRA	COVER	EXTRA
Evaluated for 9	0.9207	0.1783	0.9183	0.1723
Evaluated for 12	0.8722	0.2590	**0.8708**	**0.2474**

[0171]

[0172] ** 이들이 최상의 해법인 것 같다. 집단 에피센서스를 만들어, 클러스터화를 위한 에피센서스에서 발견된 12-mer를 제외하였다. 집단 에피센서스가 고정되고 다른 5개의 보완적인 클러스터의 최상의 에피센서스가 이와 쌍을 이루도록 선택될 때, 6개의 변형체 중 최상의 쌍이 선택되었을 때와 정확히 같은 답을 얻는다. 이는 집단 에피센서스가 항상 최상의 쌍 중의 하나인 것을 의미한다.

[0173] 오프 바이 원(Off by one): 상기 추정의 경우, 완벽한 일치된 것만이 고려되었고, 백신 칵테일과 천연 균주 사이를 일치시키기 위한 에피토프의 경우, 완벽한 12/12 일치가 요구되었다. 불일치가 특히 class II 에피토프에 대해 종종 잘 허용되었는데, 일치가 11/12 일치(agreement)를 요구하는 경우, 불일치는 10/12 이하이고, 이는 더 낙관적으로 보인다. 참(truth)은 아마도 이 사이 어디에 있을 것이고, 10/12는 일부의 경우에 또한 허용 가능할 수도 있다. 여기서 가능한 최상의 옵션을 완벽하게 일치하는 비교 가능한 최상의 천연 균주 옵션과 비교하였다.

[0174] 완벽 일치(상기 표에서 추출함):

1+5-Epi-C5	**2**	**1**	**1/5**	**6**	**0.6255**	**0.6310**	**-0.0055 ****
1+5-Natural	2	1	1/5	6	0.5724	0.6395	-0.0671

[0175]

[0176] 오프-바이-원은 일치를 고려하였음:

1+5-Epi-C5	**2**	**1**	**1/5**	**6**	**0.8700**	**0.2524**	**0.6176**
1+5-Natural	2	1	1/5	6	0.8412	0.3112	0.5300

[0177]

[0178] 세 개의 알약, 하나의 일반 약 (모든 사람에게 동일). 2 개의 맞춤형 알약, 나머지 5개의 최상의 쌍.

[0179] **실시예 4: 클레이드 B HIV-1 "맞춤형" 항원 칵테일의 고안 및 최적화.**

[0180] 집단 수준에서 HIV 다양성은 감염된 각 숙주 내에서의 급속한 진화로부터 시작한다. 내부 숙주 다양성의 대부분은 면역 탈출의 직접적인 결과이고 (Bar, KJ 2012. PLoS Pathog 8 : e1002721., Liu, MK 2013. J. Clin. Invest. 123 : 380-93), 감염 직후 탈출 변형체가 발생한다(Fischer, W. 2010. PLoS One 5:e12303). 예방 백신의 목표는 감염된 균주를 신속히 제거하거나, 처음부터 감염을 방지하는 것이다. 어떤 균주가 전염될지는 알지 못하기 때문에, 예방 백신은 직면할 수도 있는 임의의 변형체에 대해 활성일 면역 반응을 유도해야 한다. 반대로, 면역요법은 주어진 숙주 내 존재하는 공지의 바이러스 집단에 대해 지시될 수 있다. 따라서 예방 및 치료 HIV 백신은 이러한 별개의 요건을 염두에 두고 고안해야만 한다. 도 7에 나타낸 바와 같이, 모자이크 해법은 주어진 HIV 집단에 대해 가능한 최대 에피토프 커버리지에 접근한다. 또한, 상기 도는 HIV 단백질의 보존의 차이를 보여주는데, Gag, Nef 및 Pol의 다수의 분절이 고도로 보존된 반면, 대부분의 작고 보조적인 단백질뿐만 아니라 대부분의 Env는 고도로 가변적이다(데이터 없음). 모자이크는 예방 백신에 대한 집단 내의 에피토프 커버리지에 대해 거의 최적의 해법을 제공하지만, 이들은 치료 환경에서 표적된 감염 균주의 서열에 대한 지식의 추가 정보를 이용하지 않는다.

[0181] 맞춤형 백신 고안 전략의 구현은, 표적 집단의 에피토프 다양성을 최대로 포착하는 조작 가능한 수의 백신 시약을 제조하고, 감염된 백신 수용자로부터 HIV의 서열을 분석한 다음, 백신 시약 풀(pool) 중에서 개체에 가장 잘 일치하는 항원 삽입체의 아집단을 선택하는 것을 요구한다. 따라서, 맞춤형 백신 전략은 모자이크 백신 고안과 개념적으로 구별된다.

[0182] 미국에서 샘플링된 약 150,000개 HIV 서열 중 98%가 클레이드 B이다. Los Alamos HIV 데이터베이스로부터 현재 이용 가능한 미국- 표본 추출 B-클레이드 Gag 서열을 사용하였다. 이 세트에는 690개의 온전한 Gag 서열(서열번호 1-690)이 있고, 각기 다른 감염 개체로부터 유래 되었으며, 미국 HIV 균주에서 다양성의 단면을 나타낸다. 백신 칵테일에 함유될 필요가 있는 다른 Gag 서열의 수를 고정하면서 가상 백신의 T 세포 에피토프 커버리지를 최대화하기 위해, 에피토프 기반-컨센서스(또는 "에피센서스") 서열 알고리즘의 사용을 k-수단-유사 클러스터화와 결부시키는 새로운 계산 전략이 고안되었다. 정렬된 각 위치에서 가장 공통적인 아미노산을 취하는 단순한 컨센서스 서열과는 달리, 에피센서스는 정렬된 각 위치에서 시작하는 가장 공통적인 에피토프(예: 12-mer)를 찾는다. 그러나, 에피토프 중복으로 인해 각 위치에서 가장 공통적인 에피토프를 간단히 취할 수 없으며, 이는 인접한 아미노산에서 충돌(conflict)을 초래할 수 있다. 백신에 의한 집단의 최대 에피토프 커버리지를 초래하는 방식으로 이러한 충돌을 처리하는 것이 목표이다.

[0183] 집단 에피토프 다양성을 나타내는 제조용 항원의 작은 세트를 정의하기 위해, k-수단과 유사한 접근법을 사용하여 에피토프 유사성에 기초한 690개의 Gag 서열을 별개의 클러스터로 분할하고, 별개의 에피센서스 서열을 각 클러스터에 대해 생성하여 클러스터 중심 서열로서 제공하였다. 개별 변형체의 커버리지는 5-6개 클러스터 이후 하락하였고, 6개의 HIV 항원 변형체를 이용해 6개의 백신 벡터가 제조 가능하며, 따라서 6개 항원의 한 세트가 초기에 표적되었다. 이 알고리즘은 초기 중심 서열로서 무작위로 선택된 6개의 천연 균주로 시작하였고, 나머지 서열의 각각을 6개 중 어느 것이든 가장 근접한 서열에 할당한다. 6개의 클러스터 각각에서, 클러스터 내 서열의 에피센서스에 근거하여 새로운 중심 서열을 계산한다. 그런 다음 새로운 중심이 가장 근접한 것이 어느 것인지에 따라, 모든 서열이 재할당된다. 이 과정은 개별 클러스터의 에피센서스 중심으로 간주 되는 6개의 백신 항원의 고안을 위한 k-수단 유사 최적화를 거버하고, 이러한 항원은 그로부터 주어진 백신에 대해 최상의 일치를

제공한 이들을 선택하기 위한 제조 세트로써 사용될 수 있다.

[0184] 하이브리드 접근법은 잠재적인 백신-특이 반응의 증가를 최소화하면서 에피토프 커버리지를 실질적으로 개선 시키는 것으로 밝혀졌다. 하이브리드 전략에서, 중심 서열은 전체 집단(집단 에피센서스)에 대해 계산되었으며, 이후의 클러스터 화는 전적으로 중심 서열에서 발견되지 않은 에피토프만을 기반으로 하였다. 이 방식으로, 클러스터 에피센서스 서열은 집단 에피센서스를 보완한다. 따라서, 6개의 서열 시약 풀은 하나의 집단 에피센서스와 5개의 상보적인 클러스터 중심 서열로 구성되며, 개체에게는 2개의 항원 맞춤형 백신이 주어질 것이고, 집단 에피센서스는 최상의 상보적 서열과 쌍을 이루었다. 이 전략은 표 4에서 나타낸 바와 같이, 기준 세트에서 더 다양한 서열을 생성하고, 시험 집단에서 천연 Gag 서열의 잠재적 커버리지를 개선한다.

[0185] 표 4. 상이한 백신에 의한 미국 클레이드 B Gag의 잠재적 에피토프의 균주당 평균적 커버리지

표 4

[0186]

Vaccine	Delivered	Manufactured	% matched to natural Gag	%non-matched to natural Gag	Improvement factor
1 Natural	1	1	47.9	51.9	
1 Mosaic	1	1	50.7	49.1	1.06
1 Episensus	1	1	50.7	49.1	1.06
2 Natural	2	2	54.7	65.8	1.14
2 Mosaic	2	2	59.6	66.9	1.24
2 Tailored	2	6	63.4	63.1	1.32
3 Natural	3	3	59.7	73.1	1.35
3 Mosaic	3	3	63.4	74.3	1.32
3 Tailored	3	6	65.9	68.7	1.37
6 Natural	6	6	66.3	81.0	1.38
6 Mosaic	6	6	72.1	83.2	1.51

[0187] 집단 에피센서스 및 5개 클러스터 유래 상보적 서열로부터 선택된 690개 변형체 각각에 대해, 맞춤형 백신, 2- 또는 3-항원 고안이 이루어졌다. 이것은 모든 백신 접종자에게 모자이크 또는 최상의 천연 조합 중 하나인 동일한 백신이 주어지는 집단-기반 백신 전략의 잠재적인 에피토프 커버리지와 비교되었다. "전달된(delivered)"은 백신 칵테일에 포함될 항원의 수를 나타낸다. "제조된(Manufactured)"은 사용될 맞춤형 접근 방식 중, 선택하기 위해 합성될 필요가 있는 백신 항원의 참조 풀 크기를 나타낸다. "% 일치(matched)"는 자연적 Gag 변형체 각각과 백신 사이에 완벽하게 일치하는 잠재적 에피토프의 평균 수를 나타내며, 이 값이 높을수록 백신 반응이 천연 변형체와 교차 반응을 일으킬 가능성이 더 높다. "% 불일치(non-matched)"는 주어진 천연 Gag 서열에서 발견되지 않은 백신의 잠재적 에피토프 분율을 나타내며, 690개 서열 각각에 대해 따로 계산한 다음에 평균을 내었다. 이 값이 높을수록 백신이 교차-반응성 반응을 저해할 수 있는 백신 특이적 반응을 촉발할 가능성이 더 커진다. 개선 요인은 제안된 새로운 백신 고안 옵션을 사용하여 단일 최적의 천연 균주를 사용하는 것보다 커버리지가 증가했음을 나타낸다.

[0188] 12-mer에 최적화된 맞춤형 백신 해법은 9-mer에 대해서 거의 최적이고, 반대로 12-mer를 기반으로 하는 클러스터는 표 5에 나타낸 바와 같이 class I 및 class II 에피토프 제시 모두에 대해 잘 작동해야 한다.

[0189] 표 5. 2-단백질 맞춤형 고안의 평균 커버리지를 계산할 때, 9mer 또는 12mer 평가에서 단일 아미노산 불일치가 양성 일치로 간주되도록 허용함.

표 5

[0190]

	Optimized for 9mer		Optimized for 12-mer	
	% Matched	% Non-matched	% Matched	% Non-matched
Evaluated for 9-mer	92.07	17.83	91.83	17.23
Evaluated for 12-mer	87.22	25.90	87.08	24.74

[0191] 마지막으로, 맞춤형 백신 접근법은 이론적으로, 12개 중 하나의 불일치가 동일성을 요구하기 보다는 잠재적 에피토프에서 용인되는 경우, 매우 잘 수행된 것이고(표 5); 이에 좀 더 관대하고, 아마도 생물학적으로 더 현실적인 측정을 감안하면, 맞춤형 백신에 대한 백신 반응의 약 90%는 일치된 천연 Gag에서 에피토프와 교차 반응할

수 있다. 맞춤형 백신 접근법은 Gag 서열의 에피토프 커버리지를 극대화하고, 잠재적으로 유해한 백신-특이성 에피토프를 최소화하는 측면 모두에서 집단 모자이크, 컨센서스 서열 및 최적의 천연 균주보다 우수했다 (도 8). 이 코드는 또한 감염된 개인으로부터 하나의 대표적인 각각을 사용하는 대신 다중 서열을 사용하여 맞춤형 백신에 적용될 수 있으며, 맞춤형 백신 고안 전략을 다른 집단(남아프리카에서 유행성인 C 클레이드, 태국에서 유행성인 2-클레이드 및 글로벌 M 그룹 세트)에 적용하는 것을 탐구하였다.

[0192] 맞춤형 백신 항원은 감염 균주가 알려졌을 때 천연 서열보다 더 집단-기반 항원에 비교하여 우수한 커버리지를 제공할 수 있다.

[0193] **실시예 5: 이중 발현 벡터**

[0194] 본원에 기술된 집단 에피센서스 항원 및/또는 맞춤형 항원을 사용하여, 각각 완벽한 Gag 항원 및 제 2 HIV 항원을 발현하는 이중 발현 벡터를 제작하였다. 제 2 HIV 항원은 예를 들어, 역전사 효소(RT) 및 Nef의 중앙 부분 융합 단백질일 수 있다. 인테그레이즈(Integrase)는 T 세포 반응의 다소 불량한 자극제이므로 포함하지 않는다. 이중 발현 벡터로서 CMV 벡터 (예를 들어, RhCMV 또는 HCMV 벡터)를 사용하여, 2 개의 상이한 SIV 또는 HIV 항원에 T 세포를 동시에 유도하는 것이 가능하다.

[0195] 예를 들어, 개발된 에피그래프 알고리즘을 기반으로 맞춤형 Gag 서열을 포함하는 최대 6개의 HCMV 벡터의 패널을 제작하고(하나의 벡터는 Gag 집단 에피센서스 항원을 발현하고, 5개의 벡터는 상보적인 클러스터-기반 Gag 항원을 각각 발현함), RT 및 Nef의 중앙 부위를 커버하는 항원 패널도 고안하였다. Gag 집단 에피센서스 항원을 발현하는 하나의 벡터와 상이한 Gag 항원을 각각 발현하는 2개의 벡터를, 제공된 5개의 상보적인 클러스터-기반 항원에서 선택할 수 있다. 이러한 벡터는 또한 2개의 상보적인 HIV-1 에피그래프 RT/nef 서열 중 하나를 포함할 수 있다. 맞춤화가 이러한 서열들의 높은 보존성 때문에 커버리지를 개선하는 것이 예측되지 않을 경우, 2-모자이크 해법이 유지되어 벡터에 사용된다. 예를 들어, 하나의 RT/nef 모자이크는 집단 에피센서스 백터에 포함되고, 다른 하나는 맞춤형 벡터에 사용된다. 백신 생산에 참여할 수 있는 HCMV-기반 백신 벡터의 패널을 결과 벡터의 서열을 분석하고 항원 발현 및 시험관내 성장에 대해 이들을 특성화시켜 제작한다.

[0196] 합성 코돈-최적화 DNA 삽입체를 Gag, RT 및 Nef 모자이크에 상응하여 제작하고, 맞춤형 항원은 실시예 3에서 고안되었다.

[0197] **실시예 6: 에피그래프 접근법을 사용하여 개발된 바이러스성 항원의 일시적인 발현.**

[0198] 에피그래프 알고리즘을 사용하여 에피토프 빈도가 최대화되도록 고안된 항원은, 천연 서열과 유사하지만 천연 단백질을 더 이상 코딩하지 않는다. 이러한 인공적 서열의 발현에 대한 이론적 가이드라인은 이러한 서열의 구축에서 고수되는 반면, 이들에 의해 코딩되는 단백질은 예기치 않은 발현 프로파일이 나타나거나, 안정한 전장 단백질을 발현하지 못할 수 있다.

[0199] 포유동물 세포의 맥락에서 이러한 서열의 발현 프로파일을 평가하기 위해, 에피그래프 서열을 합성하고 일시적 형질감염을 위해 클로닝하였다. 플라스미드 벡터(pcDNA3.1 및 pOri)에 대해 양립 가능한 클로닝 부위를 포함하도록 이들 작제물을 코딩하는 DNA를 합성하였다(Genscript, Piscataway, NJ). 모든 삽입체는 각각의 숙주(레서스, SIV 또는 인간, HIV)에 대해 코돈 최적화되었다. 각 작제물을 문헌 [Kulkarni et al. Vaccine (2011)]에 기재된 바와 같이, 천연 서열의 잔류 효소 활성을 제거하도록 변형하였다. 삭제된 위치는 클레이드 B 에피그래프-1과 관련된 아미노산 서열을 기반으로 하였다. 삭제된 아미노산은 다음을 포함한다; 프로테아제(protease) 활성에 관련한 “DTG"(위치 81-83), 역전사 효소 활성에 관련한 "YMDD"(위치 338-341), RNaseH 활성에 관련한 "E"(위치 633), 인테그레이즈 활성에 관련한 "D"(위치 779), 인테그레이즈 활성에 관련한 "D"(위치 831), 및 인테그레이즈 활성에 관련한 "E"(위치 867). 합성 DNA를 물에서 재수화하고, 제한 엔도뉴클레아제(endonucleases)(5 'NheI, 3' BamHI)로 분해한 다음, 가열하여 불활성화시켰다. 플라스미드 벡터를 호환 가능한 엔도뉴클레아제로 선형화하고, 공(empty) 벡터의 재원형화(recircularization)를 방지하기 위해 소 장 포스파타아제를 처리하였다. 벡터 및 삽입된 단편을 아가로스 겔 전기영동으로 분석하여 분해된 단편 크기를 확인하고, PCR 정제 키트(Thermo Scientific)로 라이게이션하기 위해 세척하였다. 삽입체는 급속 라이게이션 키트(Roche, Indianapolis, IN)를 사용하여 실온에서 15분간 약 3 : 1의 삽입체 대 벡터 비로 선형화된 벡터에 연결하고, 화학적으로 적격인(competent) 대장균(DH5-alpha) 내로 형질전환시키고, 항생제 선별로 플레이트에 도말하였다. 생성된 콜로니로부터의 DNA를 삽입체에 대한 제한효소 분해로 스크리닝하였다.

[0200] 벡터의 프로모터 및 폴리 (A) 서열에 대해 적절한 배향으로 올바른 삽입체를 각각 함유하는 클론을 플라스미드 DNA 정제를 위해 액체 배양액에서 성장시켰다. 12 웰 조직 배양 플레이트에서 활발히 성장한 서브-융합성(sub-

confluent) Hela 세포를 리포좀이 준비되는 동안 500 ul의 신선한 배지(DMEM 10 % FBS)에 넣어두었다. 플라스미드 DNA를 포함하는 리포좀을 만들기 위해, 250 ul의 무혈청 배지와 500 ng의 플라스미드 DNA를 혼합하고, 250 ul의 무혈청 배지와 2 ul의 지질(Lipofectamine 2000, Invitrogen)을 혼합하였다. 실온에서 5분간 인큐베이션한 후, 이들 용액을 조합하여 혼합하고, 20분 동안 배양하였다. 이 과정에서 형성된 리포좀(500 ul)을 포함하는 DNA를 배양액에 적하하여 첨가하고, 12-16시간 동안 인큐베이션한 후, 형질감염 혼합물을 신선한 배지로 교체하였다. 추가로 하룻동안 인큐베이션한 후, 배양액을 스크래핑(scraping) 및 원심분리에 의해 수확하였다. 상청액을 흡입 제거하고, 세포 펠렛을 5% SDS 및 10% 2-메르캅토에탄올을 함유하는 100 ul의 겔 로딩 염료 중에 재현탁하여 용해한 후, QiaShred 칼럼(Qiagen, Valencia, CA)으로 원심분리하였다.

[0201] 에피그래프 단백질의 발현은 SDS 폴리아크릴아마이드 겔 전기영동(SDS-page) 및 각 작제물 내로 삽입된 V5 또는 헤마글루티닌 에피토프 태그에 대한 항체로 발색된 웨스턴 블랏팅을 통해 입증하였다. 요약하면, 10% 폴리아크릴아마이드 겔을 제조하고, 10 ul(각 샘플의 10%)를 로딩한 후, 90분 동안 110-120V에서 전기영동하였다. 분해된 단백질을 45-50분 동안 20-볼트에서 반-건조 블랏팅(semi-dry blotting)을 통해 PVDF 멤브레인으로 옮겼다. 비특이적 결합을 0.1% 트윈-20을 함유하는 PBS(PBS-T) 중의 10% 탈지 분유의 용액으로 60분 동안 차단하였다. HA(시그마) 또는 V5(산타 크루즈) 항체를 5% 우유 용액으로 희석하고, 1시간 동안 멤브레인과 함께 인큐베이션한 후, PBS-T로 3회 세척하고, 호스래디쉬 퍼옥시다데이즈가 접합된 염소 항-마우스 2차 항체의 1 : 2000 희석액으로 1시간 동안 처리하였다. 이어서, 블랏을 PBS-T로 3회 세척하고, 효소 연계 화학 발광(ECL 키트(Thermo-Pierce))으로 현상하고, X선 필름으로 가시화하였다.

[0202] 시험한 모든 작제물은 예측된 분자량의 단백질에 대해 강력한 일시적 발현을 입증하였고, CMV 벡터 백본의 시험을 위한 이들의 유용성을 확인했다(예를 들어, 도 9a-c 참조).

[0203] **실시예 7: CMV 벡터 BAC 작제물 내로 에피그래프 고안된 항원의 조작(Engineering) 및 재구성 바이러스로부터의 발현**

[0204] 에피그래프 항원을 바이러스 서열의 스펙트럼 및 이들이 생성된 HIV의 클레이드를 대표하는 T 세포 에피토프의 커버리지를 최대화하도록 고안하였다. 이러한 항원을 가장 효과적으로 활용하기 위해, 이들을 경쟁 플랫폼의 CD8+ T 세포 스펙트럼의 3배를 입증한 CMV 벡터 내로 조작하였다. CMV 벡터의 광범위한 항원 제시와 장기간(lifelong)의 발현 프로파일은 SIV에 감염된 레서스 원숭이를 보호하고 치료할 수 있는 능력을 입증하였다. CMV 벡터와 조합된 에피그래프 항원 고안 알고리즘은 광범위한 예방 백신 또는 맞춤형 집중 백신에 적용될 때, 클레이드 내부 및 전역에서 HIV의 보다 넓은 커버리지를 제공할 수 있다.

[0205] 일시적 형질감염 시스템에서 발현이 입증된 에피그래프 서열을 재조합 플라스미드(pOri) 내에 서브클로닝하고 BAC 재조합(recombineering)을 이용하여 CMV 백본으로 옮겼다(Messerle 등, Proc Natl Acad Sci USA, 1997 Dec 23, 94 (26) : 14759-63, Borst 등, J Virol, 1999 Oct; 73 (10) : 8320-9).

[0206] BAC 재조합은 모체 BAC(parental BAC)를 함유하는 대장균 EL250 균주의 맥락에서, 온도 및 대사산물을 조절된 재조합 효소를 이용하는 거대 DNA 서열의 조작을 용이하게 한다. 재조합은 표적 부위에 항생제(카나마이신) 내성 유전자를 갖는 항원 서열의 삽입 및 이어서 카나마이신 카세트의 제거로 이루어진 순차적인 2 단계 과정이다. 삽입 단편을 긴 (50 + bp) 상동성 암(homology arms)을 갖는 프라이머를 사용하여 관심 항원과 카나마이신을 포함하는 주형 DNA로부터 PCR로 증폭시킨다.

[0207] 삽입 단계를 위한 박테리아 세포를 제조하기 위해, 5 ml 배양액을 클로람페니콜이 포함된 LB(Luria Broth) 배지에서 30℃에서 밤새 성장시키고, 다음날 아침에 최대 50 ml로 희석하였다. 박테리아를 30℃에서 약 3-4시간 동안 추가 성장시키고(OD = 0.6까지), 42℃에서 15분간 교반하면서 열 충격을 가해 재조합 효소를 유도하였다. 이렇게 유도 후, 박테리아를 펠렛화(3000 rpm, 10분, 4℃)한 후 얼음 냉수로 3회 세척하였다. 대장균 세포를, BAC의 표적 부위 내로 관심 서열을 삽입하는데 적격인 PCR 생성물 및 재조합을 수용하도록 전기-적격(electro-competent)으로 만들었다. 정제된 삽입체 500 ng을 얼음상에서 100 ul의 적격 대장균과 조합하고, 0.2 cm 큐벳(Fisher)으로 옮긴 후, Bio-rad MicroPulser 장치를 사용하여 전기천공하였다. 전기천공 후, 박테리아를 900 ul의 LB 배양 배지를 추가하여 희석하고, 30℃에서 2시간 동안 회수하게 한 후, 클로람페니콜/카나마이신이 함유된 플레이트에 도말하였다. 플레이트를 30℃에서 2일 동안 인큐베이션한 후, 재조합 과정을 위한 제한효소 분해 및 PCR을 이용하여 콜로니를 스크리닝하였다.

[0208] 재조합에 대해 양성인 BAC 작제물은 카나마이신 카세트가 측면(flanking) FRT 부위에 의해 매개된 Flip 재조합 효소의 아라비노스(arabinose) 유도에 의해 제거되는 제 2 단계로 진행되었다. 5 ml의 배양액을 클로람페니콜

함유 LB 배지에서 밤새 배양하고, 다음날 아침 1 : 10으로 희석시켰다. 3시간의 성장 후 박테리아를 L-아라비노스(Arcos, 0.1 % 최종 농도)로 처리하고, 30℃에서 1.5시간 동안 유도하였다. 유도 후 박테리아를 클로람페니콜 함유 플레이트 상에 스트리킹(streak)하고 30℃에서 2일간 인큐베이션하였다. 그런 다음 콜로니를 클로람페니콜/카나마이신 및 클로람페니콜 함유 플레이트에 복제 도말하여, 카나마이신 저항성을 상실한 콜로니를 스크리닝하였다. 이들 클론을 제한효소 분해 및 PCR을 통해 추가 스크리닝하여 작제물을 확인하였다.

[0209] 바이러스 재구성: 바이러스를 재생시키기 위해, BAC DNA를 바이러스 성장을 허용하는 포유동물 숙주 세포내로 옮겼다. 밤새 배양된 배양액 10 ml로부터 정제 한 BAC DNA를 텔로머화된 섬유아세포(~200,000개 세포)의 융합성 플라스크(confluent flask)의 약 1/5 내에 전기천공하였다. 요약하면, 세포를 펠렛화(1,500 rpm, 5분)하고 700 ul Opti-Mem에 재현탁하였다. 이어서, 이 세포 혼합물을 50 ul의 BAC DNA에 첨가하고, 부드럽게 혼합한 후 4 mm 큐벳으로 옮겼다. Bio-rad GenePulser II를 사용하여 0.25 kV 및 0.95 uF에서 전기천공을 실시하였다. 전기천공 후, 세포를 DMEM + 10 % FBS가 포함된 100 mm 디쉬에 도말하고, 다음날 배지를 교환하여 세포 잔해물을 제거하였다. 세포를 매일 관찰하여 플라크 형성을 확인하고, 전체 CPE를 수확하였다. 나머지 부착된 세포를 세포 스크레퍼(cell scraper)로 수거하고, 1,500 rpm에서 5분 동안 원심분리하여 펠렛화하고, 재조합된 바이러스 벡터를 함유하는 상등액을 재조합 바이러스의 계대를 위해 유지하였다. 세포 펠렛을 5% SDS 및 10% 2-메르캅토에탄올을 함유하는 100 ul 겔 로딩 염료에 재현탁하여 용해하고, QiaShred 칼럼 (Qiagen, Valencia, CA)을 통해 원심분리하였다.

[0210] 바이러스 에피그래프 발현: 에피그래프 단백질의 발현을 SDS 폴리아크릴아마이드 겔 전기영동 (SDS-page) 및 각 작제물 내로 삽입된 V5 또는 헤마글루티닌 에피토프 태그에 대한 항체로 발색된 웨스턴 블랏팅을 통해 시험하였다. 요약하면, 10% 폴리아크릴아마이드 겔을 제조하고, 10 ul(각 샘플의 10%)를 로딩한 후, 90분 동안 110-120V에서 전기영동하였다. 분해된 단백질을 45-50분 동안 20-볼트에서 반-건조 블랏팅(semi-dry blotting)을 통해 PVDF 멤브레인으로 옮겼다. 비특이적 결합을 0.1% 트윈-20을 함유하는 PBS(PBS-T) 중의 10% 탈지 분유의 용액으로 60분 동안 차단하였다. HA(시그마) 또는 V5(산타 크루즈) 항체를 5% 우유 용액으로 희석하고, 1시간 동안 멤브레인과 함께 인큐베이션한 후, PBS-T로 3회 세척하고, 호스래디쉬 퍼옥시다데이즈가 접합된 염소 항-마우스(산타 크루즈) 2차 항체의 1 : 2000 희석액으로 1시간 동안 처리하였다. 이어서, 블랏을 PBS-T로 3회 세척하고, 효소 연계 화학 발광(ECL 키트(Thermo-Pierce))으로 현상하고, X선 필름으로 가시화하였다.

[0211] 시험한 모든 작제물은 예측된 분자량의 단백질에 대해 강력한 안정적인 발현을 입증하였고, 레서스 CMV 벡터 모델의 면역원성 시험을 위한 이들의 유용성을 확인했다(예를 들어, 도 10a-c 참조).

[0212] **실시예 8: 집단 에피그래프 백신**

[0213] 초기에는 CMV 벡터를 사용한 백신 항원 세트를 생성하는데 에피그래프 알고리즘이 사용되었으나, 다른 백신 전달 시스템이 활용될 수 있다.

[0214] B 및 C 클레이드(이러한 특정 클레이드는 유행성인 지역에서만 지리학적으로 제한된 사용)뿐만 아니라, M 그룹(글로벌)이 고려되었다. Gag, Pol 및 Nef 에피그래프 백신 항원을 제조하였고, B 및 M 그룹이 발현되었다.

[0215] 기본 에피그래프 고안 속성:

[0216] 에피그래프는 잠재적인 T 세포 에피토프(PTE) 커버리지를 최대화하는 항원을 고안하기 위해 이론적/동적 그래프 프로그래밍 접근법을 사용한다. 특정 조건하에서, 이들은 수학적으로 최적이며, 계산 효율이 매우 좋다. 에피그래프는 모자이크 항원에 비해 부가적인 명백한 이점을 갖는데, 작제물 내 더 희귀한 에피토프를 배제하는 이점은 최소한의 PTE 커버리지 손실(cost)을 맞춤으로써 균형을 이룰 수 있다. 이러한 에피그래프는, 에피그래프 항원에 나타나는 가장 희귀한 에피토프 조차도 집단 서열에서 관찰되었음을 보장하기 위해 약간의 커버리지 손실(0.005)을 허용하도록 고안되었다(정확한 숫자는 입력 데이터 세트에 따라 다르다).

[0217] 이러한 에피그래프에 대한 입력 데이터 세트는 2014년 9월경 1인당 하나의 서열을 포함하는, Gag, Pol 및 Nef 단백질 각각에 대한 HIV 데이터베이스 서열 정렬 세트로부터 얻었다. 불완전한 서열은 제외되었다. 이것은 각 단백질 세트에 대한 다음과 같은 수의 서열을 남겼으며, Nseqs는 입력 정렬의 서열 수이다.

Nseqs	Clade	Protein
1729	B	Gag
1780	B	Nef
1072	B	Pol
940	C	Gag
749	C	Nef
414	C	Pol
4596	M	Gag
4040	M	Nef
2780	M	Pol

[0218]

[0219] 2가 백신에 대해 짝지어진 에피그래프 항원 세트를 정렬되지 않은 서열에 대한 에피그래프 알고리즘을 사용하여 순차적으로 해결하였다. 단리된 1가 백신으로 첫 번째 에피그래프를 사용할 수 있는 순차적 해법이 사용되었다. 이는 이들이 최상의 단일 에피그래프 항원, 즉 "에피센서스"가 집단의 최적 PTE 커버리지를 제공하도록 먼저 해결된 후, 이것이 2가 고안 내 포함을 위해 고정되도록 고안되는 것을 의미한다. 그런 다음 보완물를 해결하여, 첫 번째 에피그래프, 에피센서스를 포함하는 2가 항원 쌍에 의한 최상의 집단 PTE 커버리지를 부여한다. 커버리지 손실은 동시 항원 해법에 비해 상대적으로 적다.

[0220] 그 후에 희귀한 변형체를 제외하는 커버리지 손실을 결정하기 위한 분석을 실시하였다. 데이터를 다음 표에 요약하였다. f_o는 희귀한 에피토프 역치이다. 서열은 f_o 또는 더 적은 서열에 나타나는 모든 PTEs를 삭제한 후에 생성된다. 즉, 백신 내 모든 PTE는 f_o 서열보다 많이 나타났다. f_o의 이러한 값은 f_o = 0 일 때 달성되는 최대 커버리지의 0.005 이내인 커버리지를 달성하면서 가능한 한 크게 만들어졌다. Nseqs는 입력 정렬의 서열 수이다.

Protein	Clade	Nseq	f_o
Gag	B	1729	41
Gag	C	940	21
Gag	M	4596	146
Nef	B	1780	50
Nef	C	749	14
Nef	M	4040	100
Pol	B	1072	34
Pol	C	414	11
Pol	M	2780	67

[0221]

[0222] 기본적인 에피그래프 항원을 완전한 단백질로서 고안하고, 이들을 CMV 벡터에서 발현시켜, Gag/Nef 융합 단백질, 또는 안전성을 위해 이루어진 결실을 갖는 Pol, 또는 융합된 Gag 및 Nef의 가장 잘 보존된 부위, 또는 융합된 Pol의 가장 잘 보존된 부위로 시험하였다. CMV 벡터에서 발현하기 위한 완전한 단백질 형태의 목록은 M 그룹 및 B 클레이드에 대한 예시와 함께, 하기에 포함된다.

[0223] 백신 항원의 보존 부위는 전장 에피그래프 단백질에서 제거된다.

[0224] Gag, Pol 및 Nef 내의 보존 부위를 2가(즉, 2 항원) 백신에 의한 PTE 커버리지의 가능성에 기초하여 정의하였다. 즉, B 클레이드의 PTE 커버리지를 제공하기 위해 이들은 두 개의 최적화된 항원에 대한 잠재력에 기초하였다. 보존 부위의 서열을 하기 목록에 나타내었다. 가능한 가장 긴 연속적 단편에서 세 개의 단백질(Gag, Pol 및 Nef) 각각의 가장 보존된 절반을 포착하기 위해 경계를 선택하였고, 따라서, 보존된 부위는 보다 가변적 부분으로 산재해있다(interspersed). Gag에 있어서, 경계는 단순히 p24 캡시드 단백질의 경계를 반영한다.

[0225] **실시예 9: 맞춤형 치료 항원**

[0226] 맞춤형 항원의 경우, Gag 또는 Gag의 가장 보존된 부위인 p24가 사용되었다. 하나의 고안에 대해, 4596개 서열의 전체 M 그룹을 2015개 정렬을 사용하여 글로벌 해법을 제공하였다. 189개의 최신의 B 클레이드 서열을 미국에서 단리하였고, 또는 199개의 최신의 C 클레이드 서열의 정렬을 남아프리카로부터 단리하였다. "최신의(contemporary)"는 2004년 이후에 단리된 바이러스를 말한다; 지난 10년 동안 샘플링된 모든 서열을 사용하여 각 지역으로부터의 서열의 합리적 표본을 추출했다. 완전히 분석되지 않았거나 불완전한 서열은 제외되었다. 맞춤형 백신에 대한 평가를 위한 개념 연구의 초기 증명의 가능성이 있는 집단에 우수한 일치를 나타내었기 때문에 지역적 아형 특이적 최신의 바이러스를 선택하였는데; 단일 아형의 지역 세트를 사용하여 본 발명자들은 HIV

치료 백신의 성공 가능성을 높이기 위해 집단 다양성을 제한할 수 있었다.

[0227] 이러한 치료용 백신 항원은 이들이 백신을 접종받는 사람의 서열 분석된 감염 바이러스에 일치되거나 "맞춤화" 될 수 있는 치료 시나리오에 사용하기 위해, 고안되었다. 6개의 백신 항원이 제조될 것이고, 개인에 감염된 바이러스에 대한 세트로부터의 가장 잘 일치하는 2~3개가 개체에 부여되어, 백신과 감염된 균주 사이의 일치를 극대화할 수 있을 것이다.

[0228] 따라서, p24를 볼드체(bold face)로 하여, 6개의 맞춤형 항원 해법을 제조하기 위해, 모든 에피그래프에 대한 전체 Gag를 아래에 제공한다. Gag 또는 더 잘 보존된 p24를 맞춤형 백신에 사용할 수 있다.

[0229] Gag 단백질 또는 내부 p24 부위에 대해, m개의 풀 중에서 가장 일치하는 항원 n을 전달하기 위해, 일치한 PTE 점수와 일치하지 않는 점수(여분의 수), 여기에서, n은 표적 집단에서 각각의 개별 서열을 가장 잘 커버하도록 선택된다. 표적 집단은 남아프리카에서 샘플링된 최신의 C 클레이드 감염 집단, 또는 미국에서 샘플링된 최신의 B 클레이드 집단이다. 최상의 해법은 m = 6 항원 풀을 사용하고, 굵게 표시하였다. 이는, 상기에 나타난 6개의 서열을 기반으로 하였다..

[0230] 남아프리카 C 클레이드 Gag의 에피토프 커버리지

n m	Coverage	Extras	Vaccine evaluated against data set
1 1	0.39886	318.437	M Epigraph
2 2	0.57907	681.980	M Epigraph
1 1	0.59591	200.809	C Epigraph
2 2	0.70758	550.618	C Epigraph
2 3	0.71875	559.206	C Tailored
3 3	0.73852	778.603	C Tailored
2 4	0.72609	550.397	C Tailored
3 4	0.75294	805.658	C Tailored
2 5	0.73124	549.452	C Tailored
3 5	0.75975	800.337	C Tailored
2 6	**0.73440**	**527.623**	C Tailored
3 6	**0.76513**	**767.759**	C Tailored

[0231]

[0232] 남아프리카 C 클레이드 p24의 에피토프 커버리지

n m	Coverage	Extras	Vaccine evaluated against data set
1 1	0.48548	114.739	M Epigraph
2 2	0.76864	230.593	M Epigraph
1 1	0.73525	59.040	C Epigraph
2 2	0.84494	204.578	C Epigraph
2 2	0.84494	204.578	C Tailored
2 3	0.86153	205.387	C Tailored
3 3	0.88154	338.417	C Tailored
2 4	0.87000	188.307	C Tailored
3 4	0.89175	290.854	C Tailored
2 5	0.87699	187.849	C Tailored
3 5	0.89945	295.930	C Tailored
2 6	**0.87996**	**191.538**	**C Tailored**
3 6	**0.90373**	**290.985**	**C Tailored**

[0233]

[0234] 미국 B 클레이드 Gag 에피토프 커버리지

n m	Coverage	Extras	Vaccine evaluated against data set
1 1	0.55488	237.815	M Epigraph
2 2	0.67323	629.333	M Epigraph
1 1	0.61174	195.720	B Epigraph
2 2	0.72471	553.899	B Epigraph
2 3	0.73615	557.254	B Tailored
3 3	0.75734	786.772	B Tailored
2 4	0.74354	547.725	B Tailored
3 4	0.76973	762.524	B Tailored
2 5	0.74786	546.111	B Tailored
3 5	0.77777	779.487	B Tailored
2 6	**0.75226**	**536.619**	**B Tailored**
3 6	**0.78669**	**773.000**	**B Tailored**

[0235]

[0236] 미국 B 클레이드 p24의 에피토프 커버리지

n m	Coverage	Extras	Vaccine evaluated against data set
1 1	0.73131	59.979	M EpiGraph
2 2	0.84204	214.296	M EpiGraph
1 1	0.76421	52.646	B EpiGraph
2 2	0.87373	201.233	B EpiGraph
2 3	0.88878	194.434	B Tailored
3 3	0.90810	297.571	B Tailored
2 4	0.89779	190.635	B Tailored
3 4	0.91754	282.386	B Tailored
2 5	0.90461	191.794	B Tailored
3 5	0.92704	285.005	B Tailored
2 6	**0.90859**	**187.889**	**B Tailored**
3 6	**0.93556**	**280.704**	**B Tailored**

[0237]

[0238] **실시예 10: 백신 시험**

[0239] CMV에서 초기 시험을 위한 백신 암(arm)은 다음을 포함한다: 1) 미국에서 유행성인 B 클레이드에 집중적인 단일 집단 에피센서스 Gag 항원; 2) 집단 에피센서스와 가장 일치하는 천연 HIV-1 균주로 선택된 맞춤형 Gag 단백질 3) 집단 에피센서스와 가장 일치하는 상이한(그리고 원격의) 천연 HIV-1 균주로 선택된 맞춤형 Gag 단백질; 4) 집단 에피센서스와, 코호트(cohort) 2와 3의 Gag 단백질 모두. 얻어진 면역 반응을 백신이 유발한 전체 Gag-특이적 반응을 결정하기 위해 백신 항원에 상응하는 15-mer 펩타이드(4개 아미노산 중복)를 사용하여 분석하였고, 그런 다음 균주-특이적 반응과 에피토프 매칭 수준을 측정하기 위해, "표적" HIV-1 균주와 선택된 비-표적 HIV 균주(아래 참조)에 대해 분석하였다(표적 대 비-표적 HIV Gag 서열 비교). 계산상 고안된 삽입체와 벡터의 조합이 비-표적 균주에 일치되는 반응을 최소화하면서, 표적 균주에 대해 보다 크고 더 넓은 T 세포 반응을 제공하는지 결정된다. 이 분석의 결과는 실시예 1에서 생성된 에피토프 매칭을 위한 예측을 실험적으로 시험할 수 있게 하였다.

[0240] 5마리 레서스 원숭이(Rhesus Macaques, RM)의 4개 코호트에 10^6 PFU의 HCMV 벡터를 다음과 같이 접종하였다: 코호트 1은 클레이드 B 에피센서스 서열을 함유하는 단일 벡터를 접종하고, 코호트 2는 에피센서스 벡터 및 단일 맞춤형 백신 벡터를 접종하고, 코호트 3은 에피센서스 및 상이한 맞춤형 백신 벡터를 접종하고, 코호트 4는 에피센서스 및 맞춤형 백신 벡터 둘 다를 접종하였다. 백신은 축방향으로 광범위하게 서열 분석된 9개의 B 클레이드 미국 HIV 감염의 작은 세트에서 선택된 2개의 대표적인 전염된/시조(transmitted/founder) HIV 균주에 대하여 "맞춤화된다"; 이 패널은 인간의 임상 시험에서 직면할 수 있는 것에 상응하는 자연 감염의 스펙트럼을 나타낸다. 실제로, 이러한 2 종의 분지된(divergent) 천연 균주를 원형 환자로 사용하고 있다. 하나에 최적화된 에피센서스/맞춤형 백신 삽입물 쌍은 다른 것에 대해서는 차선일 것이고, 반대의 경우도 마찬가지이며, 이는 각 균주의 특정 서열을 반영하는 펩타이드 세트에 대한 상호 인식의 결정을 통해, 본 발명의 맞춤형 서열 매칭 전략에 이점이 있는지 여부의 상호분석을 가능케한다. 이러한 상호 분석 외에도, 다른 7가지 감염으로부터의 서열은 선택된 백신 벡터 삽입체에 대한 이들의 상대적인 "일치"에서 달라질 것이며, 이러한 다른 7가지 HIV 균주의 서열을 반영하는 펩타이드 세트에 대한 반응을 분석함으로써, 일치된 반응 대 불일치된 반응의 크기 및 폭에 대한 벡터 삽입체의 서열과 벡터 조합 사이의 관계가 종합적으로 분석될 것이다. 이러한 9개의 균주 세트에 중점을 두는 동기의 일부는, 신중하게 서열 분석된 전장 게놈이 축방향의 샘플로부터 입수가능하다는 것이다. 분리물 또한 감염성 분자 클론으로 이용 가능하며, 이는 이후의 인간 연구에 있어서 반응을 평가하는 데 유용할 수 있다. 따라서, 이 세트를 사용하여 RM에서 토대를 마련함으로써, 이러한 백신이 인간의 연구로 발전할 때, 원숭이와 인간 반응 사이의 직접 비교를 위한 매우 유용한 일치된 단백질 세트가 될 것이다.

[0241] 레서스 원숭이(RM)를 0 일째 및 12 주째에 피하 접종하고, 1년 동안 장기에 걸쳐(longitudinally) 추적하였다. HCMV-벡터의 백신 접종은 기존의 항-RCMV 면역에 의해 영향을 받지 않으므로, RhCMV에 자연적으로 감염된 동물을 이 실험에 사용하였다. 유세포 분석기의 세포내 사이토카인 분석(ICS)을 사용하여 각 동물에게 투여된 백신 삽입체 내 백신 서열을 포함하는 개개의 연속적인 15mer 펩타이드에 대한 CD4+ 및 CD8+ T 세포 반응을 측정하였다(총 백신-유도 반응을 포함할 것임). 이들 에피토프-특이적 T 세포가 표적 균주 및 다른 8개의 비표적 균주에서 에피토프 변이체를 인지하는지 여부를 결정하였다. 균주 특이적 에피토프에 대한 반응을 나타내는 펩타이드의 경우, "모체(parent)" 백신 삽입체 서열 펩타이드 변형체에 대한 이러한 반응의 크기, 기능적 친화성 및 기능적 특성(IFN-γ, TNF-α, IL-2 및 MIP-1β 제조 및 CD107 외부화)을 비교하여, 기능적 교차 반응성의 정도를

결정하였다. 선택된 경우, 절단 분석(truncation analysis)을 사용하여 유사한 비교 분석을 위한 중심 에피토프를 확인하였다. MHC-II 제한된 CD8+ T 세포의 존재 분율을 결정하기 위해, MHC-I 및 MHC-II에 특이적인 mABs를 "차단"하고, 불변 사슬(invariant chain)-유래의 MHC-II-특이적 결합 펩타이드 CLIP을, 이전의 SIV 반응에 대해 실시된 바와 같이, PBMC에서 인플루엔자-특이적 CD8+ T 세포 반응을 억제하는데 사용하였다.

[0242] 벡터-특이적 유전자와 관련된 T 세포 프라이밍(priming) 결과에 관계없이, 면역학적 분석은 맞춤형 백신에 의해 유도된 T 세포가 비-맞춤형 백신에 비교하여주어진 천연 HIV 저장소의 에피토프 커버리지와 관련하여 우수하다는 가설의 시험을 가능케한다. 맞춤형 2가 항원 칵테일은 에피센서스 단독에 비해, 그의 일치하는 천연 균주에 대한 교차 반응의 적어도 25% 더 높은 빈도로 T 세포 반응을 생성할 가능성이 있다(표 5). 시험은 또한 칵테일에 3 가지 상보적인 맞춤형 항원의 포함이 더 많은 교차 반응을 유도하는지, 항원의 희석 또는 2개의 항원 대신에 3개를 첨가함으로써 필요로 하는 더 많은 수의 백신-특이적 에피토프의 존재 여부가 실제로 천연 단백질에 대한 교차 반응 여부의 크기 또는 폭을 감소시키는지를 결정하기 위해 수행된다. CMV 기반의 T 세포 반응은 훨씬 더 광범위하므로, 이전의 다른 벡터에 대해 보고된 것보다 훨씬 높은 비율의 서열을 커버할 것으로 예상된다. 따라서 상대적으로 적은 수의 동물일지라도, 반응의 교차 반응 가능성에 대한 서열 변형체의 영향을 평가하기에 충분한 에피토프 반응이 있어야 한다. 백신에 대한 모든 반응의 수와 크기는 백신과 일치하는 펩타이드 세트를 사용하여 결정하였다. 각각의 동물에서 양성인 바로 그러한 펩타이드만을 사용하여 표적 펩타이드가 결정되면, 각 백신-반응성 펩타이드에 대한 천연 변형체의 영향을 결정한다. 시험한 천연 변형체는 참조 패널에서 발견된 변형을 기반으로 하며, 맞춤형 및 불량하게 일치하는 Gag를 모두 포함한다. 비-매개 변수(Nonparametric) 및 계산상 재표본 통계 방법을, 인식의 감소하는 크기 또는 폐기에 대한 에피토프 변형의 영향을 평가하기 위한 주요 도구로 사용한다. 그러나, 이러한 분석은 필요에 따라 일반화된 선형 모델을 사용하여 T 세포 반응 교차-반응성에 대한 더 복잡한 상호작용의 영향을 탐구함으로써 보완된다.

서열번호: 691
Tailored vaccine antigen episensus sequence.
MGARASVLSGGELDRWEKIRLRPGGKKKYKLKHIVWASRELERFAVNPGLLETSEGCRQILGQLQPSLQTGS
EELKSLYNTVATLYCVHQKIEVKDTKEALDKIEEEQNKSKKKAQQ-------AAADTGNSS---------
QVSQNYPIVQNLQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDLNTMLNTVGGHQAAMQMLKET
INEEAAEWDRLHPVHAGPIAPGQMREPRGSDIAGTTSTLQEQIGWMTNNPPIPVGEIYKRWIILGLNKIVRMYSPTSI
LDIRQGPKEPFRDYVDRFYKTLRAEQASQEVKNWMTETLLVQNANPDCKTILKALGPAATLEEMMTACQGVGGPGHKA
RVLAEAMSQVTN--SATIMMQRGNFRNQRKTVKCFNCGKEGHIARNCRAPRKKGCWKCGKEGHQMKDC--
TERQANFLGKIWPSH-KGRPGNFLQ--------SRPEPT-----------APPEESFRFGEETTTPS----------
QKQEPIDKE-----LYP-LASLRSLFGNDPSSQ

서열번호: 692
Tailored vaccine antigen 1 sequence.
MGARASVLSGGELDKWEKIRLRPGGKKKYRLKHIVWASRELERFAVNPGLLETSGGCRQILEQLQPSLQTGS
EELRSLYNTVATLYCVHQKIDVKDTKEALEKIEEEQNKSKKKAQQ-----AAAAADTGNNS---------
QVSQNYPIVQNMQGQMVHQALSPRTLNAWVKVIEEKAFSPEVIPMFTALSEGATPQDLNTMLNSVGGHQAAMQMLKET
INEEAAEWDRVHPVHAGPVAPGQMREPRGSDIAGTTSTLQEQIGWMTSNPPIPVGEIYKRWIIMGLNKIVRMYSPTSI
LDIKQGPKEPFRDYVDRFYKTLRAEQATQEVKNWMTETLLVQNSNPDCKTILKALGPGATLEEMMTACQGVGGPSHKA
RVLAEAMSQATN--SATIMMQKGNFRNQRKIVKCFNCGKEGHIAKNCRAPRKKGCWKCGREGHQMKDC--
TERQVNFLGKIWPSH-KGRPGNFLQ--------NRPEPT-----------APPAESFRFGEETTTPP----------
QKQEPIDKE-----LYP-LASLKSLFGNDPSSQ

서열번호: 693
Tailored vaccine antigen 2 sequence.
MGARASVLSGGKLDKWEKIRLRPGGKKRYKLKHIVWASRELERFAVNPGLLETAEGCRQILGQLQPALQTGS
EELKSLFNTVATLYCVHQRIDVKDTKEALEKIEEEQNKSKKKAQP-------AAADTGSSS---------
QVSQNYPIVQNMQGQMVHQAISPRTLNAWVKVIEEKAFSPEVIPMFAALSEGATPQDLNLMLNTVGGHQAAMQMLKET
INEEAAEWDRLHPVHAGPVAPGQMREPRGSDIAGTTSTLQEQIGWMTHNPPIPVGEIYKKWIIMGLNKIVRMYSPTSI
LDIKQGPKEPFRDYVDRFYKTLRAEQATQEVKNWMTETLLVQNSNPDCKTILKALGPGATLEEMMTACQGVGGPSHKA
RVLAEAMSQATN--SATIMMQRGNFKNQRKTIKCFNCGKEGHIAKNCRAPRKKGCWKCGREGHQMKDC--
TERQANFLGKIWPSH-KGRPGNFLQ--------NRPEPT-----------APPAESFRFGEETTTPP----------
QKQEPIDKE-----LYP-LASLKSLFGNDPSSQ

서열번호: 694
Tailored vaccine antigen 3 sequence.
MGARASVLSGGELDKWEKIRLRPGGKKKYRLKHIVWASRELERFAVNPGLLETAEGCRQILEQLQPSLQTGS
EELRSLYNTVAVLYCVHQRIDVKDTKEALDKIEEEQNKSKKKAQQ-----AAAAADTGNNS---------
QVSQNYPIVQNLQGQMVHQPISPRTLNAWVKVIEEKAFSPEVIPMFTALSEGATPQDLNTMLNTVGGHQAAMQMLKDT
INEEAAEWDRLHPVQAGPIAPGQIREPRGSDIAGTTSTLQEQIAWMTNNPPIPVGDIYKRWIILGLNKIVRMYSPTSI
LDIKQGPKEPFRDYVDRFYKTLRAEQASQDVKNWMTETLLVQNSNPDCKTILKALGPGATLEEMMTACQGVGGPSHKA
RVLAEAMSQATN--SATIMMQKGNFRNQRKIVKCFNCGKEGHIAKNCRAPRKKGCWKCGREGHQMKDC--
TERQANFLGKIWPSS-KGRPGNFLQ--------SRPEPT-----------APPAESFRFGEETTTPP----------
QKQEPIDKE-----LYP-LASLKSLFGNDPSSQ

서열번호: 695
Tailored vaccine antigen 4 sequence.
MGARASVLSGGKLDKWEKIRLRPGGKKKYRLKHIVWASRELERFAVNPGLLETAEGCRQILGQLQPALQTGS
EELRSLYNTVATLYCVHQRIEVKDTKEALEKIEEEQNKSKKKVQQ------AAAADTGNSN---------
QVSQNYPIVQNIQGQMVHQPLSPRTLNAWVKVIEEKAFSPEVIPMFTALSEGATPQDLNTMLNTIGGHQAAMQMLKET
INEEAADWDRLHPVHAGPVAPGQMREPRGSDIAGTTSNLQEQIGWMTSNPPIPVGEIYKRWIIMGLNKIVRMYSPTSI
LDIKQGPKEPFRDYVDRFYKTLRAEQASQDVKNWMTETLLVQNSNPDCKTILKALGPGATLEEMMTACQGVGGPSHKA
RVLAEAMSQVTN--SATIMMQKGNFRNQRKIVKCFNCGKEGHIAKNCRAPRKRGCWKCGKEGHQMKEC--
TERQANFLGKIWPSY-KGRPGNFLQ--------SRPEPS-----------APPEESFRFGEETATPS----------
QKQEPIDKE-----LYP-LASLKSLFGNDPSSQ

[0243]

서열번호: 696
Tailored vaccine antigen 5 sequence.
MGARASVLSGGKLDKWEKIRLRPGGKKQYKLKHLVWASRELERFAVNPGLLETAEGCRQILGQLQPALQTGS
EELKSLFNTVATLYCVHQRIDVKDTKEALEKIEEEQNKSKKKAQQ-------AAADTGNNS---------
QVSQNYPIVQNIQGQMVHQALSPRTLNAWVKVIEEKAFSPEVIPMFSALAEGATPQDLNTMLNTVGGHQAAMQILKET
INEEAAEWDRLHPVQAGPVAPGQMREPRGSDIAGTTSNLQEQIAWMTHNPPIPVGEIYKRWIIMGLNKIVRMYSPVSI
LDIRQGPKEPFRDYVDRFYKTLRAEQASQDVKNWMTETLLVQNSNPDCKTILKALGPGATLEEMMTACQGVGGPSHKA
RVLAEAMSQATN--PATIMMQRGNFKNQRKIVKCFNCGKEGHIAKNCRAPRKKGCWKCGKEGHQMKEC--
TERQANFLGKIWPSY-KGRPGNFLQ--------SRPEPS-----------APPEESFRFGEETTTPP----------
QKQEPIDKE-----LYP-LTSLRSLFGNDPSSQ

서열번호: 697
EpiGraph antigen 1 sequence.
MGARASVLSGGELDRWEKIRLRPGGKKKYKLKHIVWASRELERFAVNPGLLETSEGCRQILGQLQPSLQTGS
EELKSLYNTVATLYCVHQRIDVKDTKEALDKIEEEQNKSKKKAQQ-------AAADTGNSS---------
QVSQNYPIVQNLQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDLNTMLNTVGGHQAAMQMLKET
INEEAAEWDRLHPVHAGPIAPGQMREPRGSDIAGTTSTLQEQIGWMTNNPPIPVGEIYKRWIILGLNKIVRMYSPTSI
LDIRQGPKEPFRDYVDRFYKTLRAEQASQEVKNWMTETLLVQNANPDCKTILKALGPAATLEEMMTACQGVGGPGHKA
RVLAEAMSQVTN--SATIMMQRGNFRNQRKTVKCFNCGKEGHIARNCRAPRKKGCWKCGKEGHQMKDC--
TERQANFLGKIWPSH-KGRPGNFLQ--------SRPEPT-----------APPEESFRFGEETTTPS----------
QKQEPIDKE-----LYP-LASLRSLFGNDPSSQ

서열번호: 698
Epigraph cocktail antigen 1.
MGARASVLSGGELDRWEKIRLRPGGKKKYKLKHIVWASRELERFAVNPGLLETSEGCRQILGQLQPSLQTGS
EELKSLYNTVATLYCVHQRIDVKDTKEALDKIEEEQNKSKKKAQQ-------AAADTGNSS---------
QVSQNYPIVQNLQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDLNTMLNTVGGHQAAMQMLKET
INEEAAEWDRLHPVHAGPIAPGQMREPRGSDIAGTTSTLQEQIGWMTNNPPIPVGEIYKRWIILGLNKIVRMYSPTSI
LDIRQGPKEPFRDYVDRFYKTLRAEQASQEVKNWMTETLLVQNANPDCKTILKALGPAATLEEMMTACQGVGGPGHKA
RVLAEAMSQVTN--SATIMMQRGNFRNQRKTVKCFNCGKEGHIARNCRAPRKKGCWKCGKEGHQMKDC--
TERQANFLGKIWPSH-KGRPGNFLQ--------SRPEPT-----------APPEESFRFGEETTTPS----------
QKQEPIDKE-----LYP-LASLRSLFGNDPSSQ

서열번호: 699
Epigraph cocktail antigen 2.
MGARASVLSGGKLDKWEKIRLRPGGKKKYRLKHIVWASRELERFALNPGLLETAEGCRQILGQLQPALQTGS
EELKSLFNTVATLYCVHQKIDVKDTKEALEKIEEEQNKSKKKAQQ-----AAAAADTGNNS---------
QVSQNYPIVQNMQGQMVHQALSPRTLNAWVKVIEEKAFSPEVIPMFTALSEGATPQDLNLMLNTVGGHQAAMQILKET
INEEAADWDRLHPVHAGPVAPGQMREPRGSDIAGTTSNLQEQIGWMTSNPPIPVGEIYKRWIIMGLNKIVRMYSPVSI
LDIKQGPKEPFRDYVDRVYKTLRAEQASQDVKNWMTETLLVQNSNPDCKTILKALGPGATLEEMMTACQGVGGPSHKA
RVLAEAMSQATN--SATIMMQKGNFRNQRKIVKCFNCGKEGHIAKNCRAPRKRGCWKCGKEGHQMKEC--
TERQANFLGKIWPSY-KGRPGNFLQ--------NRPEPT-----------APPAESFRFGEETTTPP----------
QKQEPIDKE-----LYP-LASLKSLFGNDPSSQ

서열번호: 700
Epigraph cocktail antigen 3.
ARASVLSGGELDKWEKIRLRPGGKKQYKLKHLVWASRELERFAINPGLLETSGGCRQILEQLQPSLQTGSEE
LRSLYNTVAVLYCVHQRIEVKDTKEALEKVEEEQNKSKKKVQQ-------AAADTGNSN---------
QVSQNYPIVQNIQGQMVHQPISPRTLNAWVKVIEDKAFSPEVIPMFAALSEGATPQDLNTMLNTIGGHQAAMQMLKDT
INEEAAEWDRLHPVQAGPVAPGQMRDPRGSDIAGTTSTLQEQIAWMTNNPPIPVGDIYKRWIILGLNKIVRMYSPTSI
LDIKQGPKESFRDYVDRFYKTLRAEQATQEVKNWMTETLLVQNANPDCRTILKALGPAATLEEMMSACQGVGGPSHKA
RILAEAMSQVTN--
STAIMMQRGNFKNQRKTVKCFNCGREGHIAKNCRAPRKKGCWKCGREGHQMKDCTERQRQANFLGKIWPSS-
KGRPGNFLQ--------SRPEPS-----------APPEESFRFGEETATPS----------QKQEPIDKE-----
LYP-LTSLRSLFGNDPSLQ

[0244]

서열번호: 701
HIV B gag/nef fusion Epigraph 1
MGARASVLSGGELDRWEKIRLRPGGKKKYRLKHIVWASRELERFAVNPGLLETSEGCRQILGQLQPSLQTGS
EELKSLYNTVATLYCVHQRIEVKDTKEALDKIEEEQNKSKKKAQQAAADTGNSSQVSQNYPIVQNLQGQMVHQAISPR
TLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDLNTMLNTVGGHQAAMQMLKETINEEAAEWDRLHPVHAGPIAPGQM
REPRGSDIAGTTSTLQEQIGWMTNNPPIPVGEIYKRWIILGLNKIVRMYSPTSILDIRQGPKEPFRDYVDRFYKTLRA
EQASQEVKNWMTETLLVQNANPDCKTILKALGPAATLEEMMTACQGVGGPGHKARVLAEAMSQVTNSATIMMQRGNFR
NQRKTVKCFNCGKEGHIAKNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSHKGRPGNFLQSRPEPTAPPEES
FRFGEETTTPSQKQEPIDKELYPLASLKSLFGNDPSSQGGKWSKSSIVGWPAVRERMRRAEPAAEGVGAVSRDLEKHG
AITSSNTAATNADCAWLEAQEEEEVGFPVRPQVPLRPMTYKGALDLSHFLKEKGGLEGLIYSQKRQDILDLWVYHTQG
YFPDWQNYTPGPGIRYPLTFGWCFKLVPVEPEKVEEANEGENNSLLHPMSQHGMDDPEKEVLMWKFDSRLAFHHMARE
LHPEYYKDC

서열번호: 702
HIV B gag/nef fusion Epigraph 2
MGARASVLSGGKLDKWEKIRLRPGGKKKYKLKHIVWASRELERFALNPGLLETSEGCKQILGQLQPALQTGS
EELRSLYNTVAVLYCVHQRIDVKDTKEALEKIEEEQNKCKKKAQQAAAAADTGNNSQVSQNYPIVQNMQGQMVHQALS
PRTLNAWVKVIEEKAFSPEVIPMFTALSEGATPQDLNTMLNTIGGHQAAMQMLKDTINEEAAEWDRVHPVHAGPVAPG
QMREPRGSDIAGTTSNLQEQIAWMTHNPPIPVGEIYKRWIIMGLNKIVRMYSPVSILDIKQGPKEPFRDYVDRFYRTL
RAEQASQDVKNWMTETLLVQNSNPDCKTILKALGPGATLEEMMTACQGVGGPSHKARVLAEAMSQVTNSATIMMQKGN
FRNQRKIVKCFNCGKEGHIARNCRAPRKRGCWKCGKEGHQMKECTERQANFLGKIWPSYKGRPGNFLQNRPEPTAPPA
ESFRFGEETATPPQKQEPIDKEMYPLASLRSLFGNDPSQGGKWSKRSVPGWNTIRERMRRTEPAAEGVGAASRDLERH
GAITSSNTAANNAACAWLEAQEDEEVGFPVKPQVPLRPMTYKAAVDLSHFLKEKGGLEGLIHSQKRQEILDLWVYNTQ
GYFPDWHNYTPGPGTRFPLTFGWCFKLVPVDPEQVEKANEGENNCLLHPMSLHGMDDPEREVLVWKFDSRLAFHHVAR
EKHPEYYKDC

서열번호: 703
HIV B pol Epigraph 1
MFFRENLAFPQGKAREFSSEQTRANSPTRRELQVWGRDNNSLSEAGADRQGTVSFSFPQITLWQRPLVTIKI
GGQLKEALLADDTVLEEMNLPGRWKPKMIGGIGGFIKVRQYDQIPIEICGHKAIGTVLVGPTPVNIIGRNLLTQIGCT
LNFPISPIETVPVKLKPGMDGPKVKQWPLTEEKIKALVEICTEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRKLV
DFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDKDFRKYTAFTIPSINNETPGIRYQYNVLPQGW
KGSPAIFQSSMTKILEPFRKQNPDIVIYQLYVGSDLEIGQHRTKIEELRQHLLRWGFTTPDKKHQKEPPFLWMGYELH
PDKWTVQPIVLPEKDSWTVNDIQKLVGKLNWASQIYAGIKVKQLCKLLRGTKALTEVVPLTEEAELELAENREILKEP
VHGVYYDPSKDLIAEIQKQGQGQWTYQIYQEPFKNLKTGKYARMRGAHTNDVKQLTEAVQKIATESIVIWGKTPKFKL
PIQKETWEAWWTEYWQATWIPEWEFVNTPPLVKLWYQLEKEPIVGAETFYVDGAANRETKLGKAGYVTDRGRQKVVSL
TDTTNQKTQAIHLALQDSGLEVNIVTDSQYALGIIQAQPDKSESELVSQIIEQLIKKEKVYLAWVPAHKGIGGNEQVD
KLVSAGIRKVLFLDGIDKAQEEHEKYHSNWRAMASDFNLPPVVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLCTHL
EGKIILVAVHVASGYIEAEVIPAETGQETAYFLLKLAGRWPVKTIHTNGSNFTSTTVKAACWWAGIKQEFGIPYNPQS
QGVVSMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIVDIIATDIQTKELQKQITKIQNFRVY
YRDSRDPLWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVASRQDED

서열번호: 704
HIV B pol Epigraph 2
MFFREDLAFPQGEAREFPSEQTRANSPTSRELQVWGGDNNSPSEAGADRQGTVSLSFPQITLWQRPLVTVKI
GGQLKEALLADDTVLEEMSLPGKWKPKMIGGIGGFIKVRQYDQVPIEICGHKTIGTVLIGPTPVNIIGRNLLTQLGCT
LNFPISPIETVPVKLKPGMDGPRVKQWPLTEEKIKALIEICTEMEKEGKISRIGPENPYNTPIFAIKKKDSTKWRKLV
DFRELNKKTQDFWEVQLGIPHPSGLKKKKSVTVLDVGDAYFSVPLDKEFRKYTAFTIPSTNNETPGIRYQYNVLPQGW
KGSPAIFQCSMTKILEPFRKQNPEIVIYQLYVGSDLEIGQHRAKIEELRQHLLKWGFTTPDKKHQKEPPFLWMGYELH
PDKWTVQPIELPEKDSWTVNDIQKLVGKLNWASQIYPGIKVRQLCKLLRGAKALTEVIPLTKEAELELAENREILREP
VHGVYYDPTKDLIAEIQKQGLGQWTYQIYQEPFKNLKTGKYARTRGAHTNDVRQLTEAVQKITTESIVIWGKTPKFRL
PIQKETWETWWTEYWQATWIPEWEFVNTPPLVKLWYQLEKEPIIGAETFYVDGASNRETKLGKAGYVTNRGRQKVISL
TDTTNQKTLQAIYLALQDSGSEVNIVTDSQYALGIIQAQPDQSESELVNQIIEQLINKEKVYLAWVPAHKGIGGNEQV
DKLVSTGIRKVLFLDGIDRAQEEHEKYHNNWRAMASDFNLPPIVAKEIVASCDKCQLKGEAIHGQVDCSPGIWQLCTH
LEGKVILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKTVHTNGSNFTSATVKAACWWAGVKQEFGIPYNPQ
SQGVVSMNNELKKIIGQIRDQAEHLKTAVQMAVFIHNFKRKGGIGEYSAGERIIDIIATDIQTRELQKQITKIQNFRV
YYRDNRDPLWKGPAKLLWKGEGAVVIQDNSEIKVVPRRKVKIIRDYGKQMAGDDCVAGRQDED

[0245]

서열번호: 705
HIV M gag/nef fusion Epigraph 1
MGARASVLSGGKLDAWEKIRLRPGGKKKYRLKHLVWASRELERFALNPGLLETSEGCRQILGQLQPSLQTGS
EELKSLYNTVATLYCVHQRIEVKDTKEALDKIEEEQNKSKKKAQQAAADTGNSSQVSQNYPIVQNLQGQMVHQAISPR
TLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDLNTMLNTVGGHQAAMQMLKETINEEAAEWDRLHPVHAGPIAPGQM
REPRGSDIAGTTSTLQEQIGWMTNNPPIPVGEIYKRWIILGLNKIVRMYSPVSILDIRQGPKEPFRDYVDRFYKTLRA
EQATQEVKNWMTETLLVQNANPDCKTILKALGPAATLEEMMTACQGVGGPGHKARVLAEAMSQVTNSATIMMQRGNFK
GQKRIKCFNCGKEGHIARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSHKGRPGNFLQSRPEPTAPPEESF
RFGEETTTPSQKQEPIDKELYPLASLKSLFGNDPLSQGGKWSKSSIVGWPAVRERMRRAEPAAEGVGAVSRDLEKHGA
ITSSNTAATNADCAWLEAQEEEEVGFPVRPQVPLRPMTYKGALDLSHFLKEKGGLEGLIYSKKRQEILDLWVYHTQGY
FPDWQNYTPGPGIRYPLTFGWCFKLVPVDPREVEEANEGENNCLLHPMSQHGMDDPEKEVLMWKFDSRLAFHHMAREL
HPEYYKDC

서열번호: 706
HIV M gag/nef conserved Epigraph 1
MPIVQNLQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDLNTMLNTVGGHQAAMQMLKE
TINEEAAEWDRLHPVHAGPIAPGQMREPRGSDIAGTTSTLQEQIGWMTNNPPIPVGEIYKRWIILGLNKIVRMYSPVS
ILDIRQGPKEPFRDYVDRFYKTLRAEQATQEVKNWMTETLLVQNANPDCKTILKALGPAATLEEMMTACQGVGGPGHK
ARVLVGFPVRPQVPLRPMTYKGALDLSHFLKEKGGLEGLIYSKKRQEILDLWVYHTQGYFPDWQNYTPGPGIRYPLTF
GWCFKLVP

서열번호: 707
HIV M gag/nef fusion Epigraph 2
MGARASVLSGGELDRWEKIRLRPGGKKKYKLKHIVWASRELERFAVNPGLLETAEGCQQIIEQLQSTLKTGS
EELKSLFNTVAVLYCVHQRIDVKDTKEALEKIEEEQNKSQQKTQQAAAGTGSSSKVSQNYPIVQNAQGQMVHQPLSPR
TLNAWVKVIEEKAFSPEVIPMFTALSEGATPQDLNMMLNIVGGHQAAMQMLKDTINEEAAEWDRVHPVHAGPIPPGQM
REPRGSDIAGTTSNLQEQIGWMTSNPPIPVGDIYKRWIILGLNKIVRMYSPTSILDIKQGPKEPFRDYVDRFFKTLRA
EQASQEVKNWMTDTLLVQNANPDCKTILRALGPGATLEEMMTACQGVGGPSHKARVLAEAMSQVTNSATIMMQRGNFR
NQRKTVKCFNCGKEGHLARNCRAPRKKGCWKCGREGHQMKDCNERQANFLGKIWPSNKGRPGNFPQSRPEPTAPPAES
FRFEETTPAPKQEPKDREPLTSLKSLFGSDPLSQGSKWSKSSIVGWPAIRERMRRTEPAAEGVGAASRDLERHGAITS
SNTAANNADCAWLEAQEDEEVGFPVKPQVPLRPMTYKAAFDLSFFLKEKGGLDGLIYSQKRQDILDLWVYNTQGFFPD
WQNYTPGPGVRYPLTFGWCFKLVPVEPEKVEEANEGENNSLLHPMSLHGMDDPEREVLMWKFDSSLARRHMARELHPE
FYKDC

서열번호: 708
HIV M gag/nef conserved Epigraph 2
MPIVQNAQGQMVHQPLSPRTLNAWVKVIEEKAFSPEVIPMFTALSEGATPQDLNMMLNIVGGHQAAMQMLKD
TINEEAAEWDRVHPVHAGPIPPGQMREPRGSDIAGTTSNLQEQIGWMTSNPPIPVGDIYKRWIILGLNKIVRMYSPTS
ILDIKQGPKEPFRDYVDRFFKTLRAEQASQEVKNWMTDTLLVQNANPDCKTILRALGPGATLEEMMTACQGVGGPSHK
ARVLVGFPVKPQVPLRPMTYKAAFDLSFFLKEKGGLDGLIYSQKRQDILDLWVYNTQGFFPDWQNYTPGPGVRYPLTF
GWCFKLVP

서열번호: 709
HIV M pol Epigraph 1
MFFRENLAFPQGEAREFSSEQTRANSPTRRELQVWGRDNNSLSEAGADRQGTVSFSFPQITLWQRPLVTIKI
GGQLKEALLADDTVLEDINLPGKWKPKMIGGIGGFIKVRQYDQILIEICGKKAIGTVLVGPTPVNIIGRNLLTQIGCT
LNFPISPIETVPVKLKPGMDGPKVKQWPLTEEKIKALVEICTEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRKLV
DFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDKDFRKYTAFTIPSINNETPGIRYQYNVLPQGW
KGSPAIFQSSMTKILEPFRKQNPDIVIYQLYVGSDLEIGQHRTKIEELRQHLLKWGFTTPDKKHQKEPPFLWMGYELH
PDKWTVQPIVLPEKDSWTVNDIQKLVGKLNWASQIYPGIKVKQLCKLLRGAKALTDIVPLTEEAELELAENREILKEP
VHGVYYDPSKDLIAEIQKQGQDQWTYQIYQEPFKNLKTGKYARMRGAHTNDVKQLTEAVQKIATESIVIWGKTPKFRL
PIQKETWETWWTEYWQATWIPEWEFVNTPPLVKLWYQLEKEPIVGAETFYVDGAANRETKLGKAGYVTDRGRQKVVSL
TETTNQKTLQAIHLALQDSGSEVNIVTDSQYALGIIQAQPDKSESELVNQIIEQLIKKEKVYLSWVPAHKGIGGNEQV
DKLVSSGIRKVLFLDGIDKAQEEHEKYHSNWRAMASDFNLPPIVAKEIVASCDKCQLKGEAMHGQVDCSPGIWQLCTH
LEGKVILVAVHVASGYIEAEVIPAETGQETAYFLLKLAGRWPVKVIHTNGSNFTSAAVKAACWWAGIKQEFGIPYNPQ
SQGVVSMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIATDIQTKELQKQITKIQNFRV
YYRDSRDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDEDQ

[0246]

서열번호: 710
HIV M pol conserved Epigraph 1
MPQITLWQRPLVTIKIGGQLKEALLADDTVLEDINLPGKWKPKMIGGIGGFIKVRQYDQILIEICGKKAIGT
VLVGPTPVNIIGRNLLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEKIKALVEICTEMEKEGKISKIGPE
NPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDKDFRKYTAFT
IPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRKQNPDIVIYQLYVGSDLEIGQHRTKIEELRQHLLKWG
FTTPDKKHQKEPPFLWMGYELHPDKWTVQPIVLPEKDSWTVNDIQKLVGKLNWASQIYHGQVDCSPGIWQLCTHLEGK
VILVAVHVASGYIEAEVIPAETGQETAYFLLKLAGRWPVKVIHTNGSNFTSAAVKAACWWAGIKQEFGIPYNPQSQGV
VSMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIATDIQTKLQKQITKIQNFRVYYRDS
RDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDEDQ

서열번호: 711
HIV M pol Epigraph 2
MFFREDLAFPQGKAREFPSEQTRANSPTRGELQVWGGDNNSPSEAGADRQGTVSFSFPQITLWQRPLVSIKV
GGQIKEALLADDTVLEEMNLPGRWKPKMIGGIGGFIKVRQYDQIPIEICGHKAIGTVLIGPTPVNIIGRNMLTQLGCT
LNFPISPIDTVPVTLKPGMDGPRVKQWPLTEEKIKALTEICKEMEKEGKITKIGPENPYNTPIFAIKKKDSTKWRKLV
DFRELNKKTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDESFRKYTAFTIPSTNNETPGIRYQYNVLPQGW
KGSPAIFQCSMTKILEPFRIKNPEIVIYQLYVGSDLEIGQHRAKIEELREHLLRWGFTTPDKKHQKEPPFLWMGYELH
PDRWTVQPIELPEKDSWTVNDIQKLVGKLNWASQIYAGIKVRQLCKLLRGTKALTEVVPLTEEAELELAENREILKTP
VHGVYYDPSKDLVAEIQKQGQGQWTYQIYQEPYKNLKTGKYARKRSAHTNDVRQLTEVVQKIATESIVIWGKTPKFKL
PIQKETWEAWWTDYWQATWIPDWEFVNTPPLVKLWYQLEKDPIVGAETFYVDGAASRETKLGKAGYVTNRGRQKVVSL
TDTTNQKTLHAIHLALQDSGLEVNIVTDSQYALGIIQAQPDRSESEVVNQIIEELIKKEKVYLAWVPAHKGIGGNEQV
DKLVSAGIRKVLFLDGIDKAQEEHERYHSNWRTMASDFNLPPVVAKEIVANCDKCQLKGEAIHGQVDCSPGMWQLCTH
LEGKIILVAVHVASGYMEAEVIPAETGQETAYFILKLAGRWPVKTIHTNGSNFTSTTVKAACWWAGIQQEFGIPYNPQ
SQGVVSMNNELKKIIGQVREQAEHLKTAVQMAVFIHNFKRRGGIGGYSAGERIVDIIATDIQTRELQKQIIKIQNFRV
YYRDSRDPLWKGPAKLLWKGEGAVVIQDNSEIKVVPRRKVKIIKDYGKQMAGDDCVASRQDED

서열번호: 712
HIV M pol conserved Epigraph 2
MPQITLWQRPLVSIKVGGQIKEALLADDTVLEEMNLPGRWKPKMIGGIGGFIKVRQYDQIPIEICGHKAIGT
VLIGPTPVNIIGRNMLTQLGCTLNFPISPIDTVPVTLKPGMDGPRVKQWPLTEEKIKALTEICKEMEKEGKITKIGPE
NPYNTPIFAIKKKDSTKWRKLVDFRELNKKTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDESFRKYTAFT
IPSTNNETPGIRYQYNVLPQGWKGSPAIFQCSMTKILEPFRIKNPEIVIYQLYVGSDLEIGQHRAKIEELREHLLRWG
FTTPDKKHQKEPPFLWMGYELHPDRWTVQPIELPEKDSWTVNDIQKLVGKLNWASQIYHGQVDCSPGMWQLCTHLEGK
IILVAVHVASGYMEAEVIPAETGQETAYFILKLAGRWPVKTIHTNGSNFTSTTVKAACWWAGIQQEFGIPYNPQSQGV
VSMNNELKKIIGQVREQAEHLKTAVQMAVFIHNFKRRGGIGGYSAGERIVDIIATDIQTRLQKQIIKIQNFRVYYRDS
RDPLWKGPAKLLWKGEGAVVIQDNSEIKVVPRRKVKIIKDYGKQMAGDDCVASRQDED

서열번호: 713
SIV gag/nef hybrid
MGARGSVLSGKKTDELEKVRLRPGGRKKYMLKHIVWAARELDRFGSAESLLESKEGCQRILAVLAPLMPTGS
EDLKSLFSTVCVVWCLHAEMKVKDTEEAKKTVQSHLVVESGTAETMPAQSRPTAPPSGRGGNYPVQQIGGNYVHLPLS
PRTLNAWVKLIEEKKFGAEVVPGFQALSEGCTPYDINQMLNCVGDHQAAMQIIRDIINEEAADWDLQHPQPAPQQGQL
REPSGSDIAGTTSSVDEQIQWMYRQQNPIPVGNIYRRWIQLGLQKCVRMYNPTNILDVKQGPKEPFQSYVDRFYKSLR
AEQTDAAVKNWMTQTLLIQNANPDCKLVLKGLGVNPTLEEMLTACQGVGGPGQKARLMAEALKDALTPGPIPFAAVQQ
RGQRKIIKCWNCGKTGHSARQCKAPRRKGCWKCGKAGHVMAKCPERQAGFLGFGPWGKKPHNFPMAQMPQGLTPTAPP
ADPAVDMLKNYMKMGKRQREKQRENRERPYKEVSEDLLHLSSLFGEDQPGGATSKRRSKPSGDLRQKLLRARGENYGR
LWGELEDGSSQSLGGLGKGLSSRSCEGQKYSQGQFMNTPWKNPAEEKEKLPYRKQNIDDVDEEDNDLVGVSVRPKVPL
RTMSYKLAIDMSHFIKEKGGLEGIYYSARRHRILDIYLEKEEGIIPDWQDYTSGPGIRYPKTFGWLWKLVPVDMSNEA
QEDDTHYLVHPAQTHQWSDPWGEVLVWKFDPLLAHTYEAFVRHPEEFGWKSGLPKEEVERRLAARGLLKMADKKETR

서열번호: 714
SIV gag/nef conserved
MPVQQIGGNYVHLPLSPRTLNAWVKLIEEKKFGAEVVPGFQALSEGCTPYDINQMLNCVGDHQAAMQIIRDI
INEEAADWDLQHPQPAPQQGQLREPSGSDIAGTTSSVDEQIQWMYRQQNPIPVGNIYRRWIQLGLQKCVRMYNPTNIL
DVKQGPKEPFQSYVDRFYKSLRAEQTDAAVKNWMTQTLLIQNANPDCKLVLKGLGVNPTLEEMLTACQGVGGPGQKAR
LMVGVSVRPKVPLRTMSYKLAIDMSHFIKEKGGLEGIYYSARRHRILDIYLEKEEGIIPDWQDYTSGPGIRYPKTFGW
LWKLVP

[0247]

서열번호: 715
SIV pol hybrid
MFFRAWPMGKEASQFPHGPDASGADTNCSPRGSSCGSTEELHEVGQKAERKAEGEQRETLQGGNGGFAAPQF
SLWRRPVVTAHIEGQPVEVLLADDSIVTGIELGPHYTPKIVGGIGGFINTKEYKNVEIEVLGKRIKGTIMTGDTPINI
FGRNLLTALGMSLNFPIAKVEPVKVALKPGKDGPKLKQWPLSKEKIVALREICEKMEKDGQLEEAPPTNPYNTPTFAI
KKKDKNKWRMLIDFRELNRVTQDFTEVQLGIPHPAGLAKRKRITVLDIGDAYFSIPLDEEFRQYTAFTLPSVNNAEPG
KRYIYKVLPQGWKGSPAIFQYTMRHVLEPFRKANPDVTLVQILIASDRTDLEHDRVVLQSKELLNSIGFSTPEEKFQK
DPPFQWMGYELWPTKWKLQKIELPQRETWTVNDIQKLVGVLNWAAQIYPGIKTKNLCKMIRGKMALTEGVQWTELAEA
ELEENRIILNQEQEGRYYREDKPLEATVLKNQDNQWTYKIHQGDRILKVGKYAKVKNTHTNGIRLLANVVQKIGKESI
VIWGQTPFFHLPVEREVWDQWWTDYWQATWIPDWDFVSTPPLIRLVFNLVKEPIEKEEVYYIDGSCNRNSKEGKAGYV
TDRGKEKVLVLEQATNQQALQAFLLALKDSGPKANIVTDSQYVLGIITGQPTESDSRIVAQIIEQMIKKSEVYIGWVP
AHKGLGGNQEVDRLVSQEIRQVLFLESIEPAQEDHDKYHSNIKELAFKFGLPRLVAKQIVDTCNKCQQKGEAIHGQAN
SDLGTWQMCTHLEGKIIIVAVHVASGFIEAEVIPQETGRQTALFLLKLAGRWPITHLHTNGANFASQEVKMVAWWAGI
EHTFGVPYNPQSQGVVAMNHHLKNQIDRIREQANSVETIVLMAVHCMNFKRRGGIGDMTPAERLINMITTEQEIQFQQ
SKNSKFKNFRVYYREGRDQLWKGPGELLWKGEGAVILKVGTDIKVVPRRKAKIIKDYGGGKEVDSSSHMEDTGEAREV
A

서열번호: 716
SIV pol conserved
MPQFSLWRRPVVTAHIEGQPVEVLLADDSIVTGIELGPHYTPKIVGGIGGFINTKEYKNVEIEVLGKRIKGT
IMTGDTPINIFGRNLLTALGMSLNFPIAKVEPVKVALKPGKDGPKLKQWPLSKEKIVALREICEKMEKDGQLEEAPPT
NPYNTPTFAIKKKDKNKWRMLIDFRELNRVTQDFTEVQLGIPHPAGLAKRKRITVLDIGDAYFSIPLDEEFRQYTAFT
LPSVNNAEPGKRYIYKVLPQGWKGSPAIFQYTMRHVLEPFRKANPDVTLVQILIASDRTDLEHDRVVLQSKELLNSIG
FSTPEEKFQKDPPFQWMGYELWPTKWKLQKIELPQRETWTVNDIQKLVGVLNWAAQIYHGQANSDLGTWQMCTHLEGK
IIIVAVHVASGFIEAEVIPQETGRQTALFLLKLAGRWPITHLHTNGANFASQEVKMVAWWAGIEHTFGVPYNPQSQGV
VAMNHHLKNQIDRIREQANSVETIVLMAVHCMNFKRRGGIGDMTPAERLINMITTEQEIQFQQSKNSKFKNFRVYYRE
GRDQLWKGPGELLWKGEGAVILKVGTDIKVVPRRKAKIIKDYGGGKEVDSSSHMEDTGEAREVA

서열번호: 717
HIV B pol epigraph1
FFRENLAFPQGKAREFSSEQTRANSPTRRELQVWGRDNNSLSEAGADRQGTVSFSFPQITLWQRPLVTIKIG
GQLKEALLDTGADDTVLEEMNLPGRWKPKMIGGIGGFIKVRQYDQIPIEICGHKAIGTVLVGPTPVNIIGRNLLTQIG
CTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEKIKALVEICTEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRK
LVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDKDFRKYTAFTIPSINNETPGIRYQYNVLPQ
GWKGSPAIFQSSMTKILEPFRKQNPDIVIYQYMDDLYVGSDLEIGQHRTKIEELRQHLLRWGFTTPDKKHQKEPPFLW
MGYELHPDKWTVQPIVLPEKDSWTVNDIQKLVGKLNWASQIYAGIKVKQLCKLLRGTKALTEVVPLTEEAELELAENR
EILKEPVHGVYYDPSKDLIAEIQKQGQGQWTYQIYQEPFKNLKTGKYARMRGAHTNDVKQLTEAVQKIATESIVIWGK
TPKFKLPIQKETWEAWWTEYWQATWIPEWEFVNTPPLVKLWYQLEKEPIVGAETFYVDGAANRETKLGKAGYVTDRGR
QKVVSLTDTTNQKTELQAIHLALQDSGLEVNIVTDSQYALGIIQAQPDKSESELVSQIIEQLIKKEKVYLAWVPAHKG
IGGNEQVDKLVSAGIRKVLFLDGIDKAQEEHEKYHSNWRAMASDFNLPPVVAKEIVASCDKCQLKGEAMHGQVDCSPG
IWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFLLKLAGRWPVKTIHTDNGSNFTSTTVKAACWWAGIKQ
EFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIVDIIATDIQTKELQK
QITKIQNFRVYYRDSRDPLWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVASRQDED

서열번호: 718
HIV M gag Epigraph1
MGARASVLSGGKLDAWEKIRLRPGGKKKYRLKHLVWASRELERFALNPGLLETSEGCRQILGQLQPSLQTGS
EELKSLYNTVATLYCVHQRIEVKDTKEALDKIEEEQNKSKKKAQQAAADTGNSSQVSQNYPIVQNLQGQMVHQAISPR
TLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDLNTMLNTVGGHQAAMQMLKETINEEAAEWDRLHPVHAGPIAPGQM
REPRGSDIAGTTSTLQEQIGWMTNNPPIPVGEIYKRWIILGLNKIVRMYSPVSILDIRQGPKEPFRDYVDRFYKTLRA
EQATQEVKNWMTETLLVQNANPDCKTILKALGPAATLEEMMTACQGVGGPGHKARVLAEAMSQVTNSATIMMQRGNFK
GQKRIKCFNCGKEGHIARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSHKGRPGNFLQSRPEPTAPPEESF
RFGEETTTPSQKQEPIDKELYPLASLKSLFGNDPLSQ

[0248]

서열번호: 719
HIV M gag Epigraph1 Conserved
PIVQNLQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDLNTMLNTVGGHQAAMQMLKET
INEEAAEWDRLHPVHAGPIAPGQMREPRGSDIAGTTSTLQEQIGWMTNNPPIPVGEIYKRWIILGLNKIVRMYSPVSI
LDIRQGPKEPFRDYVDRFYKTLRAEQATQEVKNWMTETLLVQNANPDCKTILKALGPAATLEEMMTACQGVGGPGHKA
RVL

서열번호: 720
HIV M gag Epigraph2
MGARASVLSGGELDRWEKIRLRPGGKKKYKLKHIVWASRELERFAVNPGLLETAEGCQQIIEQLQSTLKTGS
EELKSLFNTVAVLYCVHQRIDVKDTKEALEKIEEEQNKSQQKTQQAAAGTGSSSKVSQNYPIVQNAQGQMVHQPLSPR
TLNAWVKVIEEKAFSPEVIPMFTALSEGATPQDLNMMLNIVGGHQAAMQMLKDTINEEAAEWDRVHPVHAGPIPPGQM
REPRGSDIAGTTSNLQEQIGWMTSNPPIPVGDIYKRWIILGLNKIVRMYSPTSILDIKQGPKEPFRDYVDRFFKTLRA
EQASQEVKNWMTDTLLVQNANPDCKTILRALGPGATLEEMMTACQGVGGPSHKARVLAEAMSQVTNSATIMMQRGNFR
NQRKTVKCFNCGKEGHLARNCRAPRKKGCWKCGREGHQMKDCNERQANFLGKIWPSNKGRPGNFPQSRPEPTAPPAES
FRFEETTPAPKQEPKDREPLTSLKSLFGSDPLSQ

서열번호: 721
HIV M gag Epigraph2 Conserved
PIVQNAQGQMVHQPLSPRTLNAWVKVIEEKAFSPEVIPMFTALSEGATPQDLNMMLNIVGGHQAAMQMLKDT
INEEAAEWDRVHPVHAGPIPPGQMREPRGSDIAGTTSNLQEQIGWMTSNPPIPVGDIYKRWIILGLNKIVRMYSPTSI
LDIKQGPKEPFRDYVDRFFKTLRAEQASQEVKNWMTDTLLVQNANPDCKTILRALGPGATLEEMMTACQGVGGPSHKA
RVL

서열번호: 722
HIV M nef Epigraph1
MGGKWSKSSIVGWPAVRERMRRAEPAAEGVGAVSRDLEKHGAITSSNTAATNADCAWLEAQEEEEVGFPVRP
QVPLRPMTYKGALDLSHFLKEKGGLEGLIYSKKRQEILDLWVYHTQGYFPDWQNYTPGPGIRYPLTFGWCFKLVPVDP
REVEEANEGENNCLLHPMSQHGMDDPEKEVLMWKFDSRLAFHHMARELHPEYYKDC

서열번호: 723
HIV M nef Epigraph1 Conserved
VGFPVRPQVPLRPMTYKGALDLSHFLKEKGGLEGLIYSKKRQEILDLWVYHTQGYFPDWQNYTPGPGIRYPL
TFGWCFKLVP

서열번호: 724
HIV M nef Epigraph2
MGSKWSKSSIVGWPAIRERMRRTEPAAEGVGAASRDLERHGAITSSNTAANNADCAWLEAQEDEEVGFPVKP
QVPLRPMTYKAAFDLSFFLKEKGGLDGLIYSQKRQDILDLWVYNTQGFFPDWQNYTPGPGVRYPLTFGWCFKLVPVEP
EKVEEANEGENNSLLHPMSLHGMDDPEREVLMWKFDSSLARRHMARELHPEFYKDC

서열번호: 725
HIV M nef Epigraph2 Conserved
VGFPVKPQVPLRPMTYKAAFDLSFFLKEKGGLDGLIYSQKRQDILDLWVYNTQGFFPDWQNYTPGPGVRYPL
TFGWCFKLVP

[0249]

서열번호: 726
HIV M pol Epigraph1
FFRENLAFPQGEAREFSSEQTRANSPTRRELQVWGRDNNSLSEAGADRQGTVSFSFPQITLWQRPLVTIKIG
GQLKEALLDTGADDTVLEDINLPGKWKPKMIGGIGGFIKVRQYDQILIEICGKKAIGTVLVGPTPVNIIGRNLLTQIG
CTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEKIKALVEICTEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRK
LVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDKDFRKYTAFTIPSINNETPGIRYQYNVLPQ
GWKGSPAIFQSSMTKILEPFRKQNPDIVIYQYMDDLYVGSDLEIGQHRTKIEELRQHLLKWGFTTPDKKHQKEPPFLW
MGYELHPDKWTVQPIVLPEKDSWTVNDIQKLVGKLNWASQIYPGIKVKQLCKLLRGAKALTDIVPLTEEAELELAENR
EILKEPVHGVYYDPSKDLIAEIQKQGQDQWTYQIYQEPFKNLKTGKYARMRGAHTNDVKQLTEAVQKIATESIVIWGK
TPKFRLPIQKETWETWWTEYWQATWIPEWEFVNTPPLVKLWYQLEKEPIVGAETFYVDGAANRETKLGKAGYVTDRGR
QKVVSLTETTNQKTELQAIHLALQDSGSEVNIVTDSQYALGIIQAQPDKSESELVNQIIEQLIKKEKVYLSWVPAHKG
IGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHEKYHSNWRAMASDFNLPPIVAKEIVASCDKCQLKGEAMHGQVDCSPG
IWQLDCTHLEGKVILVAVHVASGYIEAEVIPAETGQETAYFLLKLAGRWPVKVIHTDNGSNFTSAAVKAACWWAGIKQ
EFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIATDIQTKELQK
QITKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDEDQ

서열번호: 727
HIV M pol Epigraph1 Conserved
PQITLWQRPLVTIKIGGQLKEALLDTGADDTVLEDINLPGKWKPKMIGGIGGFIKVRQYDQILIEICGKKAI
GTVLVGPTPVNIIGRNLLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEKIKALVEICTEMEKEGKISKIG
PENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDKDFRKYTA
FTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRKQNPDIVIYQYMDDLYVGSDLEIGQHRTKIEELRQ
HLLKWGFTTPDKKHQKEPPFLWMGYELHPDKWTVQPIVLPEKDSWTVNDIQKLVGKLNWASQIYHGQVDCSPGIWQLD
CTHLEGKVILVAVHVASGYIEAEVIPAETGQETAYFLLKLAGRWPVKVIHTDNGSNFTSAAVKAACWWAGIKQEFGIP
YNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIATDIQTKELQKQITKI
QNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDEDQ

서열번호: 728
HIV M pol Epigraph2
FFREDLAFPQGKAREFPSEQTRANSPTRGELQVWGGDNNSPSEAGADRQGTVSFSFPQITLWQRPLVSIKVG
GQIKEALLDTGADDTVLEEMNLPGRWKPKMIGGIGGFIKVRQYDQIPIEICGHKAIGTVLIGPTPVNIIGRNMLTQLG
CTLNFPISPIDTVPVTLKPGMDGPRVKQWPLTEEKIKALTEICKEMEKEGKITKIGPENPYNTPIFAIKKKDSTKWRK
LVDFRELNKKTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDESFRKYTAFTIPSTNNETPGIRYQYNVLPQ
GWKGSPAIFQCSMTKILEPFRIKNPEIVIYQYMDDLYVGSDLEIGQHRAKIEELREHLLRWGFTTPDKKHQKEPPFLW
MGYELHPDRWTVQPIELPEKDSWTVNDIQKLVGKLNWASQIYAGIKVRQLCKLLRGTKALTEVVPLTEEAELELAENR
EILKTPVHGVYYDPSKDLVAEIQKQGQGQWTYQIYQEPYKNLKTGKYARKRSAHTNDVRQLTEVVQKIATESIVIWGK
TPKFKLPIQKETWEAWWTDYWQATWIPDWEFVNTPPLVKLWYQLEKDPIVGAETFYVDGAASRETKLGKAGYVTNRGR
QKVVSLTDTTNQKTELHAIHLALQDSGLEVNIVTDSQYALGIIQAQPDRSESEVVNQIIEELIKKEKVYLAWVPAHKG
IGGNEQVDKLVSAGIRKVLFLDGIDKAQEEHERYHSNWRTMASDFNLPPVVAKEIVANCDKCQLKGEAIHGQVDCSPG
MWQLDCTHLEGKIILVAVHVASGYMEAEVIPAETGQETAYFILKLAGRWPVKTIHTDNGSNFTSTTVKAACWWAGIQQ
EFGIPYNPQSQGVVESMNNELKKIIGQVREQAEHLKTAVQMAVFIHNFKRRGGIGGYSAGERIVDIIATDIQTRELQK
QIIKIQNFRVYYRDSRDPLWKGPAKLLWKGEGAVVIQDNSEIKVVPRRKVKIIKDYGKQMAGDDCVASRQDED

서열번호: 729
HIV M pol Epigraph2 Conserved
PQITLWQRPLVSIKVGGQIKEALLDTGADDTVLEEMNLPGRWKPKMIGGIGGFIKVRQYDQIPIEICGHKAI
GTVLIGPTPVNIIGRNMLTQLGCTLNFPISPIDTVPVTLKPGMDGPRVKQWPLTEEKIKALTEICKEMEKEGKITKIG
PENPYNTPIFAIKKKDSTKWRKLVDFRELNKKTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDESFRKYTA
FTIPSTNNETPGIRYQYNVLPQGWKGSPAIFQCSMTKILEPFRIKNPEIVIYQYMDDLYVGSDLEIGQHRAKIEELRE
HLLRWGFTTPDKKHQKEPPFLWMGYELHPDRWTVQPIELPEKDSWTVNDIQKLVGKLNWASQIYHGQVDCSPGMWQLD
CTHLEGKIILVAVHVASGYMEAEVIPAETGQETAYFILKLAGRWPVKTIHTDNGSNFTSTTVKAACWWAGIQQEFGIP
YNPQSQGVVESMNNELKKIIGQVREQAEHLKTAVQMAVFIHNFKRRGGIGGYSAGERIVDIIATDIQTRELQKQIIKI
QNFRVYYRDSRDPLWKGPAKLLWKGEGAVVIQDNSEIKVVPRRKVKIIKDYGKQMAGDDCVASRQDED

[0250]

서열번호: 730
HIV B gag Epigraph1
MGARASVLSGGELDRWEKIRLRPGGKKKYRLKHIVWASRELERFAVNPGLLETSEGCRQILGQLQPSLQTGS
EELKSLYNTVATLYCVHQRIEVKDTKEALDKIEEEQNKSKKKAQQAAADTGNSSQVSQNYPIVQNLQGQMVHQAISPR
TLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDLNTMLNTVGGHQAAMQMLKETINEEAAEWDRLHPVHAGPIAPGQM
REPRGSDIAGTTSTLQEQIGWMTNNPPIPVGEIYKRWIILGLNKIVRMYSPTSILDIRQGPKEPFRDYVDRFYKTLRA
EQASQEVKNWMTETLLVQNANPDCKTILKALGPAATLEEMMTACQGVGGPGHKARVLAEAMSQVTNSATIMMQRGNFR
NQRKTVKCFNCGKEGHIAKNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSHKGRPGNFLQSRPEPTAPPEES
FRFGEETTTPSQKQEPIDKELYPLASLKSLFGNDPSSQ

서열번호: 731
HIV B gag Epigraph1 Conserved
PIVQNLQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDLNTMLNTVGGHQAAMQMLKET
INEEAAEWDRLHPVHAGPIAPGQMREPRGSDIAGTTSTLQEQIGWMTNNPPIPVGEIYKRWIILGLNKIVRMYSPTSI
LDIRQGPKEPFRDYVDRFYKTLRAEQASQEVKNWMTETLLVQNANPDCKTILKALGPAATLEEMMTACQGVGGPGHKA
RVL

서열번호: 732
HIV B gag Epigraph2
MGARASVLSGGKLDKWEKIRLRPGGKKKYKLKHIVWASRELERFALNPGLLETSEGCKQILGQLQPALQTGS
EELRSLYNTVAVLYCVHQRIDVKDTKEALEKIEEEQNKSKKRAQQAAADTGNNSQVSQNYPIVQNMQGQMVHQPISPR
TLNAWVKVIEEKAFSPEVIPMFTALSEGATPQDLNTMLNTVGGHQAAMQILKETINEEAADWDRLHPVHAGPVAPGQM
REPRGSDIAGTTSNLQEQIGWMTSNPPIPVGEIYKRWIIMGLNKIVRMYSPVSILDIKQGPKEPFRDYVDRFYKVLRA
EQASQDVKNWMTETLLVQNSNPDCKTILKALGPGATLEEMMTACQGVGGPSHKARILAEAMSQVTNSATIMMQKGNFR
NQRKIVKCFNCGKEGHIARNCRAPRKKGCWKCGREGHQMKDCNERQANFLGKIWPSYKGRPGNFLQNRPEPTAPPAES
FRFGEETTTPPQKQEPIDKDLYPLASLRSLFGNDPSS

서열번호: 733
HIV B gag Epigraph2 Conserved
PIVQNMQGQMVHQPISPRTLNAWVKVIEEKAFSPEVIPMFTALSEGATPQDLNTMLNTVGGHQAAMQILKET
INEEAADWDRLHPVHAGPVAPGQMREPRGSDIAGTTSNLQEQIGWMTSNPPIPVGEIYKRWIIMGLNKIVRMYSPVSI
LDIKQGPKEPFRDYVDRFYKVLRAEQASQDVKNWMTETLLVQNSNPDCKTILKALGPGATLEEMMTACQGVGGPSHKA
RIL

서열번호: 734
HIV B nef Epigraph1
MGGKWSKSSIVGWPAVRERMRRAEPAAEGVGAVSRDLEKHGAITSSNTAATNADCAWLEAQEEEEVGFPVRP
QVPLRPMTYKGALDLSHFLKEKGGLEGLIYSQKRQDILDLWVYHTQGYFPDWQNYTPGPGIRYPLTFGWCFKLVPVEP
EKVEEANEGENNSLLHPMSQHGMDDPEKEVLMWKFDSRLAFHHMARELHPEYYKDC

서열번호: 735
HIV B nef Epigraph1 Conserved
GFPVRPQVPLRPMTYKGALDLSHFLKEKGGLEGLIYSQKRQDILDLWVYHTQGYFPDWQNYTPGPGIRYPLT
FGWCFKLVP

서열번호: 736
HIV B nef Epigraph2
MGGKWSKSSVVGWPAIRERMRRAEPAADGVGAASRDLERHGAITSSNTAANNAACAWLEAQEDEEVGFPVKP
QVPLRPMTYKAAVDLSHFLKEKGGLEGLIHSQKRQEILDLWVYHTQGFFPDWQNYTPGPGTRFPLTFGWCFKLVPVDP
DKVEEANEGENNCLLHPMSLHGMDDPEREVLVWKFDSRLAFHHVARELHPEYYKNC

서열번호: 737
HIV B nef Epigraph2 Conserved
GFPVKPQVPLRPMTYKAAVDLSHFLKEKGGLEGLIHSQKRQEILDLWVYHTQGFFPDWQNYTPGPGTRFPLTFGWCFK
LVP

[0251]

서열번호: 738
HIV B pol Epigraph1
FFRENLAFPQGKAREFSSEQTRANSPTRRELQVWGRDNNSLSEAGADRQGTVSFSFPQITLWQRPLVTIKIG
GQLKEALLDTGADDTVLEEMNLPGRWKPKMIGGIGGFIKVRQYDQIPIEICGHKAIGTVLVGPTPVNIIGRNLLTQIG
CTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEKIKALVEICTEMEKEGKISKIGPENPYNTPVFAIKKKDSTKWRK
LVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDKDFRKYTAFTIPSINNETPGIRYQYNVLPQ
GWKGSPAIFQSSMTKILEPFRKQNPDIVIYQYMDDLYVGSDLEIGQHRTKIEELRQHLLRWGFTTPDKKHQKEPPFLW
MGYELHPDKWTVQPIVLPEKDSWTVNDIQKLVGKLNWASQIYAGIKVKQLCKLLRGTKALTEVVPLTEEAELELAENR
EILKEPVHGVYYDPSKDLIAEIQKQGQGQWTYQIYQEPFKNLKTGKYARMRGAHTNDVKQLTEAVQKIATESIVIWGK
TPKFKLPIQKETWEAWWTEYWQATWIPEWEFVNTPPLVKLWYQLEKEPIVGAETFYVDGAANRETKLGKAGYVTDRGR
QKVVSLTDTTNQKTELQAIHLALQDSGLEVNIVTDSQYALGIIQAQPDKSESELVSQIIEQLIKKEKVYLAWVPAHKG
IGGNEQVDKLVSAGIRKVLFLDGIDKAQEEHEKYHSNWRAMASDFNLPPVVAKEIVASCDKCQLKGEAMHGQVDCSPG
IWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFLLKLAGRWPVKTIHTDNGSNFTSTTVKAACWWAGIKQ
EFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIVDIIATDIQTKELQK
QITKIQNFRVYYRDSRDPLWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVASRQDED

서열번호: 739
HIV B pol Epigraph1 Conserved
PQITLWQRPLVTIKIGGQLKEALLDTGADDTVLEEMNLPGRWKPKMIGGIGGFIKVRQYDQIPIEICGHKAI
GTVLVGPTPVNIIGRNLLTQIGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEKIKALVEICTEMEKEGKISKIG
PENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDKDFRKYTA
FTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRKQNPDIVIYQYMDDLYVGSDLEIGQHRTKIEELRQ
HLLRWGFTTPDKKHQKEPPFLWMGYELHPDKWTVQPIVLPEKDSWTVNDIQKLVGKLNWASQIYHGQVDCSPGIWQLD
CTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYFLLKLAGRWPVKTIHTDNGSNFTSTTVKAACWWAGIKQEFGIP
YNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIVDIIATDIQTKELQKQITKI
QNFRVYYRDSRDPLWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVASRQDED

서열번호: 740
HIV B pol Epigraph2
FFREDLAFPQGEAREFPSEQTRANSPTRGELQVWGGDNNSPSEAGADRQGTVSLSFPQITLWQRPLVTIKVG
GQLKEALLDTGADDTVLEDMNLPGKWKPKMIGGIGGFIKVRQYDQILIEICGHKAIGTVLIGPTPVNIIGRNLLTQLG
CTLNFPISPIDTVPVKLKPGMDGPRVKQWPLTEEKIKALIEICTEMEKEGKISRIGPENPYNTPIFAIKKKDSTKWRK
LVDFRELNKKTQDFWEVQLGIPHPSGLKKKKSVTVLDVGDAYFSVPLDKEFRKYTAFTIPSTNNETPGIRYQYNVLPQ
GWKGSPAIFQCSMTKILEPFRKQNPEIVIYQYMDDLYVGSDLEIEQHRTKIEELRQHLLKWGFTTPDKKHQKEPPFLW
MGYELHPDKWTVQPIMLPEKDSWTVNDIQKLVGKLNWASQIYPGIKVRQLCKLLRGAKALTEVIPLTEEAELELAENR
EILREPVHGVYYDPTKDLIAEIQKQGLGQWTYQIYQEPYKNLKTGKYARTRGAHTNDVRQLTEAVQKITTESIVIWGK
TPKFRLPIQKETWETWWTEYWQATWIPEWEFVNTPPLVKLWYQLEKEPIIGAETFYVDGAANRDTKLGKAGYVTNKGR
QKVVTLTDTTNQKTELQAIYLALQDSGSEVNIVTDSQYALGIIQAQPDKSESELVNQIIEQLIKKEKIYLAWVPAHKG
IGGNEQVDKLVSSGIRKVLFLDGIDKAQEDHEKYHSNWKAMASDFNLPPIVAKEIVASCDKCQLKGEAIHGQVDCSPG
IWQLDCTHLEGKVILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKTVHTDNGSNFTSATVKAACWWAGVKQ
EFGIPYNPQSQGVVESMNNELKKIIGQIRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIATDIQTRELQK
QITKIQNFRVYYRDNRDPLWKGPAKLLWKGEGAVVIQDNSEIKVVPRRKVKIIRDYGKQMAGDDCVAGRQDED

서열번호: 741
HIV B pol Epigraph2 Conserved
PQITLWQRPLVTIKVGGQLKEALLDTGADDTVLEDMNLPGKWKPKMIGGIGGFIKVRQYDQILIEICGHKAI
GTVLIGPTPVNIIGRNLLTQLGCTLNFPISPIDTVPVKLKPGMDGPRVKQWPLTEEKIKALIEICTEMEKEGKISRIG
PENPYNTPIFAIKKKDSTKWRKLVDFRELNKKTQDFWEVQLGIPHPSGLKKKKSVTVLDVGDAYFSVPLDKEFRKYTA
FTIPSTNNETPGIRYQYNVLPQGWKGSPAIFQCSMTKILEPFRKQNPEIVIYQYMDDLYVGSDLEIEQHRTKIEELRQ
HLLKWGFTTPDKKHQKEPPFLWMGYELHPDKWTVQPIMLPEKDSWTVNDIQKLVGKLNWASQIYHGQVDCSPGIWQLD
CTHLEGKVILVAVHVASGYIEAEVIPAETGQETAYFILKLAGRWPVKTVHTDNGSNFTSATVKAACWWAGVKQEFGIP
YNPQSQGVVESMNNELKKIIGQIRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIATDIQTRELQKQITKI
QNFRVYYRDNRDPLWKGPAKLLWKGEGAVVIQDNSEIKVVPRRKVKIIRDYGKQMAGDDCVAGRQDED

[0252]

서열번호: 742
HIV C gag Epigraph1
MGARASILRGGKLDKWEKIRLRPGGKKHYMLKHLVWASRELERFALNPGLLETSEGCKQIMKQLQPALQTGT
EELRSLYNTVATLYCVHEKIEVRDTKEALDKIEEEQNKSQQKTQQAKAADGKVSQNYPIVQNLQGQMVHQAISPRTLN
AWVKVIEEKAFSPEVIPMFTALSEGATPQDLNTMLNTVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPIAPGQMREP
RGSDIAGTTSTLQEQIAWMTSNPPIPVGDIYKRWIILGLNKIVRMYSPVSILDIKQGPKEPFRDYVDRFFKTLRAEQA
TQDVKNWMTDTLLVQNANPDCKTILRALGPGATLEEMMTACQGVGGPGHKARVLAEAMSQANSNIMMQRSNFKGPKRI
VKCFNCGKEGHIARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSHKGRPGNFLQSRPEPTAPPAEPTAPPA
ESFRFEETTPAPKQEPKDREPLTSLKSLFGSDPLSQ

서열번호: 743
HIV C gag Epigraph1 Conserved
PIVQNLQGQMVHQAISPRTLNAWVKVIEEKAFSPEVIPMFTALSEGATPQDLNTMLNTVGGHQAAMQMLKDT
INEEAAEWDRLHPVHAGPIAPGQMREPRGSDIAGTTSTLQEQIAWMTSNPPIPVGDIYKRWIILGLNKIVRMYSPVSI
LDIKQGPKEPFRDYVDRFFKTLRAEQATQDVKNWMTDTLLVQNANPDCKTILRALGPGATLEEMMTACQGVGGPGHKA
RVL

서열번호: 744
HIV C gag Epigraph2
MGARASVLRGEKLDKWERIRLRPGGKKRYMLKHIVWASRELEKFALNPGLLETAEGCKQIIKQLHPALQTGT
EELKSLFNTVATLYCVHKKIDVRDTKEALDKIEEEQNKCQQKTQQAEAADKGKVSQNYPIVQNLQGQMVHQALSPRTL
NAWVKVVEEKAFSPEIIPMFTALSEGATPTDLNTMLNTVGGHQAAMQMLKDTINEEAAEWDRVHPVHAGPVAPGQMRE
PRGSDIAGTTSNLQEQIAWMTNNPPIPVGEIYKRWIILGLNKIVRMYSPVSILDIRQGPKEPFRDYVDRFFKVLRAEQ
ATQEVKNWMTETLLVQNANPDCKTILRALGPGASLEEMMTACQGVGGPSHKARVLAEAMSQANNANIMMQRSNFKGSK
RIVKCFNCGKEGHIAKNCRAPRKKGCWKCGREGHQMKDCNERQANFLGKIWPSNKGRPGNFLQNRPEPTAPPAEPTAP
PAESFKFEETTPAPKQESKDREPLISLKSLFGNDPLSQ

서열번호: 745
HIV C gag Epigraph2 Conserved
PIVQNLQGQMVHQALSPRTLNAWVKVVEEKAFSPEIIPMFTALSEGATPTDLNTMLNTVGGHQAAMQMLKDT
INEEAAEWDRVHPVHAGPVAPGQMREPRGSDIAGTTSNLQEQIAWMTNNPPIPVGEIYKRWIILGLNKIVRMYSPVSI
LDIRQGPKEPFRDYVDRFFKVLRAEQATQEVKNWMTETLLVQNANPDCKTILRALGPGASLEEMMTACQGVGGPSHKA
RVL

서열번호: 746
HIV C nef Epigraph1
MGGKWSKSSIVGWPAVRERIRRTEPAAEGVGAASQDLDKYGALTSSNTAHNNADCAWLQAQEEEEEVGFPVR
PQVPLRPMTYKAAFDLSFFLKEKGGLEGLIYSKKRQEILDLWVYHTQGFFPDWQNYTPGPGVRYPLTFGWCFKLVPVD
PREVEEANEGENNCLLHPMSQHGMEDEDREVLKWQFDSSLARRHMARELHPEYYKDC

서열번호: 747
HIV C nef Epigraph1 Conserved
GFPVRPQVPLRPMTYKAAFDLSFFLKEKGGLEGLIYSKKRQEILDLWVYHTQGFFPDWQNYTPGPGVRYPLT
FGWCFKLV

서열번호: 748
HIV C nef Epigraph2
MGSKWSKSSIVGWPAVRERMRRAEPAAEGVGAASRDLDKHGALTSSNTPANNADCAWLEAQEEEGEVGFPVK
PQVPLRPMTYKGAFDLGFFLKEKGGLDGLIYSKKRQDILDLWVYNTQGYFPDWQNYTPGPGIRYPLTFGWCYKLVPVD
PSEVEEANKGENNCLLHPMSLHGMEDEHREVLKWKFDSSLARRHLAREKHPEFYKDC

서열번호: 749
HIV C nef Epigraph2 Conserved
GFPVKPQVPLRPMTYKGAFDLGFFLKEKGGLDGLIYSKKRQDILDLWVYNTQGYFPDWQNYTPGPGIRYPLT
FGWCYKLV

[0253]

서열번호: 750
HIV C pol Epigraph1
FFRENLAFPQGEAREFPSEQTRANSPTSRANSPTSRELQVRGDNPRSEAGAERQGTLNFPQITLWQRPLVSI
KVGGQIKEALLDTGADDTVLEEINLPGKWKPKMIGGIGGFIKVRQYDQILIEICGKKAIGTVLVGPTPVNIIGRNMLT
QLGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEKIKALTAICEEMEKEGKITKIGPENPYNTPVFAIKKKDSTK
WRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDEGFRKYTAFTIPSINNETPGIRYQYNV
LPQGWKGSPAIFQSSMTKILEPFRAQNPEIVIYQYMDDLYVGSDLEIGQHRAKIEELREHLLKWGFTTPDKKHQKEPP
FLWMGYELHPDKWTVQPIQLPEKDSWTVNDIQKLVGKLNWASQIYPGIKVRQLCKLLRGAKALTDIVPLTEEAELELA
ENREILKEPVHGVYYDPSKDLIAEIQKQGHDQWTYQIYQEPFKNLKTGKYAKMRTAHTNDVKQLTEAVQKIAMESIVI
WGKTPKFRLPIQKETWETWWTDYWQATWIPEWEFVNTPPLVKLWYQLEKEPIAGAETFYVDGAANRETKIGKAGYVTD
RGRQKIVSLTETTNQKTELQAIQLALQDSGSEVNIVTDSQYALGIIQAQPDKSESELVNQIIEQLIKKERVYLSWVPA
HKGIGGNEQVDKLVSSGIRKVLFLDGIDKAQEEHEKYHSNWRAMASEFNLPPIVAKEIVASCDKCQLKGEAIHGQVDC
SPGIWQLDCTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYYILKLAGRWPVKVIHTDNGSNFTSAAVKAACWWAG
IQQEFGIPYNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIATDIQTKE
LQKQIIKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKVKIIKDYGKQMAGADCVAGRQDEDQ

서열번호: 751
HIV C pol Epigraph1 Conserved
PQITLWQRPLVSIKVGGQIKEALLDTGADDTVLEEINLPGKWKPKMIGGIGGFIKVRQYDQILIEICGKKAI
GTVLVGPTPVNIIGRNMLTQLGCTLNFPISPIETVPVKLKPGMDGPKVKQWPLTEEKIKALTAICEEMEKEGKITKIG
PENPYNTPVFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDEGFRKYTA
FTIPSINNETPGIRYQYNVLPQGWKGSPAIFQSSMTKILEPFRAQNPEIVIYQYMDDLYVGSDLEIGQHRAKIEELRE
HLLKWGFTTPDKKHQKEPPFLWMGYELHPDKWTVQPIQLPEKDSWTVNDIQKLVGKLNWASQIYHGQVDCSPGIWQLD
CTHLEGKIILVAVHVASGYIEAEVIPAETGQETAYYILKLAGRWPVKVIHTDNGSNFTSAAVKAACWWAGIQQEFGIP
YNPQSQGVVESMNKELKKIIGQVRDQAEHLKTAVQMAVFIHNFKRKGGIGGYSAGERIIDIIATDIQTKELQKQIIKI
QNFRVYYRDSRDPIWKGPAKLLWKGEGAVVIQDNSDIKVVPRRKVKIIKDYGKQMAGADCVAGRQDEDQ

서열번호: 752
HIV C pol Epigraph2
FFRENLAFQQGEAREFPSEQARANSPTSRANSPTSRELQVRGDNPCSEAGAERQGTFNFPQITLWQRPLVTI
KVGGQIKEALLDTGADDTVLEDINLPGKWKPRMIGGIGGFIKVRQYDQIPIEICGKKAIGSVLVGPTPVNIIGRNLLT
QLGCTLNFPISPIETIPVKLKPGMDGPRVKQWPLTEEKIKALTEICEEMEKEGKISKIGPENPYNTPIFAIKKKDSTK
WRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDESFRKYTAFTIPSTNNETPGIRYQYNV
LPQGWKGSPAIFQSSMTRILEPFRAKNPEIVIYQYMDDLYVGSDLEIEQHRAKIEELREHLLRWGFTTPDKKHQKEPP
FLWMGYELHPDKWTVQPIQLPEKESWTVNDIQKLVGKLNWASQIYPGIKVKQLCKLLRGTKALTDIVPLTEEAELELA
ENREILREPVHGVYYDPSKELIAEIQKQGQDQWTYQIYQEPFKNLKTGKYAKRRTAHTNDVRQLTEAVQKIALESIVI
WGKIPKFRLPIQKETWEIWWTDYWQATWIPDWEFVNTPPLVKLWYQLEKEPIAGVETFYVDGAANRETKLGKAGYVTD
KGRQKIVTLTETTNQKAELQAIQLALQDSGPEVNIVTDSQYALGIIQAQPDKSESEIVNQIIEQLINKERIYLSWVPA
HKGIGGNEQVDKLVSNGIRKVLFLDGIDKAQEEHEKYHNNWRAMASDFNLPPVVAKEIVASCDQCQLKGEAMHGQVDC
SPGIWQLDCTHLEGKVILVAVHVASGYMEAEVIPAETGQETAYFILKLAGRWPVKIIHTDNGSNFTSTAVKAACWWAG
IKQEFGIPYNPQSQGVVESMNKELKKIIGQVREQAEHLKTAVQMAVFIHNFKRRGGIGGYSAGERIIDIIASDIQTKE
LQKQITKIQNFRVYYRDSRDPIWKGPAKLLWKGEGAVVLQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDED

서열번호: 753
HIV C pol Epigraph2 Conserved
PQITLWQRPLVTIKVGGQIKEALLDTGADDTVLEDINLPGKWKPRMIGGIGGFIKVRQYDQIPIEICGKKAI
GSVLVGPTPVNIIGRNLLTQLGCTLNFPISPIETIPVKLKPGMDGPRVKQWPLTEEKIKALTEICEEMEKEGKISKIG
PENPYNTPIFAIKKKDSTKWRKLVDFRELNKRTQDFWEVQLGIPHPAGLKKKKSVTVLDVGDAYFSVPLDESFRKYTA
FTIPSTNNETPGIRYQYNVLPQGWKGSPAIFQSSMTRILEPFRAKNPEIVIYQYMDDLYVGSDLEIEQHRAKIEELRE
HLLRWGFTTPDKKHQKEPPFLWMGYELHPDKWTVQPIQLPEKESWTVNDIQKLVGKLNWASQIYHGQVDCSPGIWQLD
CTHLEGKVILVAVHVASGYMEAEVIPAETGQETAYFILKLAGRWPVKIIHTDNGSNFTSTAVKAACWWAGIKQEFGIP
YNPQSQGVVESMNKELKKIIGQVREQAEHLKTAVQMAVFIHNFKRRGGIGGYSAGERIIDIIASDIQTKELQKQITKI
QNFRVYYRDSRDPIWKGPAKLLWKGEGAVVLQDNSDIKVVPRRKAKIIRDYGKQMAGDDCVAGRQDE

[0254]

서열번호: 754
HIV M Gag episensus EG-0, Tailored
MGARASVLSGGKLDAWEKIRLRPGGKKKYRLKHLVWASRELERFALNPGLLETSEGCRQILGQLQPSLQTGS
EELKSLYNTVATLYCVHQRIEVKDTKEALDKIEEEQNKSKKKAQQAAADTGNSSQVSQNYPIVQNLQGQMVHQAISPR
TLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDLNTMLNTVGGHQAAMQMLKETINEEAAEWDRLHPVHAGPIAPGQM
REPRGSDIAGTTSTLQEQIGWMTNNPPIPVGEIYKRWIILGLNKIVRMYSPVSILDIRQGPKEPFRDYVDRFYKTLRA
EQATQEVKNWMTETLLVQNANPDCKTILKALGPAATLEEMMTACQGVGGPGHKARVLAEAMSQVTNSATIMMQRGNFK
GQKRIKCFNCGKEGHIARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSHKGRPGNFLQSRPEPTAQSRPEP
TAPPAESFRPQPTAPPEESFRFGEETTTPSQKQEPIDKELYPLASLKSLFGNDPLSQY

서열번호: 755
HIV M gag episensus EG-0 Conserved, Tailored
PIVQNLQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDLNTMLNTVGGHQAAMQMLKET
INEEAAEWDRLHPVHAGPIAPGQMREPRGSDIAGTTSTLQEQIGWMTNNPPIPVGEIYKRWIILGLNKIVRMYSPVSI
LDIRQGPKEPFRDYVDRFYKTLRAEQATQEVKNWMTETLLVQNANPDCKTILKALGPAATLEEMMTACQGVGGPGHKA
RVL

서열번호: 756
HIV M gag CEN-1, Tailored
MGARASVLTGGKLDAWERIRLRPGGKKKYRMKHLVWASRELERFAINPGLLETAEGCQQIIEQLQSTLKTGS
EELKSLFNTVATLWCVHQRIEIKDTKEALDKLEEVQNKSQQKTQQAAAGTGSSSKVSQNYPIVQNAQGQMVHQPLSPR
TLNAWVKVVEEKGFNPEVIPMFSALSDGATPQDLNMMLNIVGGHQAAMQMLKDTINEEAAEWDRVHPVHAGPIPPGQM
REPRESDIAGTTSNLQEQIGWMTSNPPIPVGDIYKRWIILGLHKIVRMYSPVGILDIKQGPKEPFRDYVDRFFKTLRA
EQASQEVKNWMTETLLIQNANPDCKSILKALGTGATLEEMMTACQGVGGPSHKARVLAEAMSQAQHANIMMQRGNFKG
QRKIKCFNCGKEGHLARNCRAPRKRGCWKCGQEGHQMKDCNERQANFLGKIWPSNKGRPGNFPQSRPEPTAPRTEPTA
PPARPEPTAPPLQSRLEPTAPPAEPTAPPAENWGMGEEITSLLKQEQKDKEHPPPLVSLKSLFGNDPLLQ

서열번호: 757
HIV M gag CEN-1 Conserved, Tailored
PIVQNAQGQMVHQPLSPRTLNAWVKVVEEKGFNPEVIPMFSALSDGATPQDLNMMLNIVGGHQAAMQMLKDT
INEEAAEWDRVHPVHAGPIPPGQMREPRESDIAGTTSNLQEQIGWMTSNPPIPVGDIYKRWIILGLHKIVRMYSPVGI
LDIKQGPKEPFRDYVDRFFKTLRAEQASQEVKNWMTETLLIQNANPDCKSILKALGTGATLEEMMTACQGVGGPSHKA
RVL

서열번호: 758
HIV M gag CEN-2, Tailored
MGARASILRGGKLDKWEKIRLRPGGKKHYMLKHIVWASRELEKFALNPDLLETSEGCKQIIKQLQPALQTGT
EELRSLFNTVATLYCVHEKIEVRDTKEALDKVEEEQNKSQQKTQQAKAADGKVSQNYPIVQNAQGQMVHQALSPRTLN
AWVKVIEEKAFSPEVIPMFTALSEGATPSDLNTMLNTIGGHQAAMQMLKDTINEEAAEWDRVHPVHAGPVAPGQMREP
RGSDIAGSTSTLQEQIAWMTSNPPIPVGDIYKRWIILGLNKIVKMYSPVSILDIKQGPKEPFRDYVDRFFKTLRAEQA
TQDVKNWMTDTLLVQNANPDCKTILRALGPGATLEEMMTACQGVGGPSHKARVLAEAMSQANSNIMMQRSNFKGPKRI
VKCFNCGKEGHIAKNCRAPRKKGCWKCGREGHQMKDCNERQANFLGKIWPSNKGRPGNFLQNRPEPTAPPLQSRLEPT
APLEPTAPPEPTAPPAVVPTAPPVEPTAPPAEPTAPPAESFRFEETTPAPKQEPKDREPLTSLKSLFGSDPLSQ

서열번호: 759
HIV M gag CEN-2 Conserved, Tailored
PIVQNAQGQMVHQALSPRTLNAWVKVIEEKAFSPEVIPMFTALSEGATPSDLNTMLNTIGGHQAAMQMLKDT
INEEAAEWDRVHPVHAGPVAPGQMREPRGSDIAGSTSTLQEQIAWMTSNPPIPVGDIYKRWIILGLNKIVKMYSPVSI
LDIKQGPKEPFRDYVDRFFKTLRAEQATQDVKNWMTDTLLVQNANPDCKTILRALGPGATLEEMMTACQGVGGPSHKA
RVL

[0255]

서열번호: 760
HIV M gag CEN-3, Tailored
MGSRASVLSGGELDRWEKIRLRPGGKKKYKLKHIVWASRELERFAVNPGLLETSEGCKQILGQLQPALQTGS
EELRSLYNTVAVLYCVHQRIDVKDTKEALEKIEEEQNKCKKKAQQAAAAADTGNNSQVSQNYPIVQNIQGQMVHQALS
PRTLNAWVKVIEEKAFSPEVIPMFTALSEGATPSDLNTMLNTIGGHQAAMQMLKDTINEEAADWDRLHPVQAGPVAPG
QMRDPRGSDIAGTTSNLQEQIGWMTSNPPIPVGDIYKRWIIMGLNKIVRMYSPTSILDIKQGPKEPFRDYVDRFFKTL
RAEQASQEVKNWMTETLLVQNSNPDCKTILKALGPGATLEEMMTACQGVGGPSHKARVLAEAMSQATNSAAIMMQRGN
FRNQRKIVKCFNCGKEGHIAKNCRAPRKRGCWKCGREGHQMKDCNERQANFLGRIWPSNKGRPGNFLQNRPEPTAPNF
LQSRPEPSAPPEPTAPPEESFRFGEETATPSQKQEPTDKELYPLASLRSLFGNDPSSQ

서열번호: 761
HIV M gag CEN-3 Conserved, Tailored
PIVQNIQGQMVHQALSPRTLNAWVKVIEEKAFSPEVIPMFTALSEGATPSDLNTMLNTIGGHQAAMQMLKDT
INEEAADWDRLHPVQAGPVAPGQMRDPRGSDIAGTTSNLQEQIGWMTSNPPIPVGDIYKRWIIMGLNKIVRMYSPTSI
LDIKQGPKEPFRDYVDRFFKTLRAEQASQEVKNWMTETLLVQNSNPDCKTILKALGPGATLEEMMTACQGVGGPSHKA
RVL

서열번호: 762
HIV M gag CEN-4, Tailored
MGTRASVLSGGELDRWEKIRLRPGGKKKYKLKHIVWASRELERFAVNPGLLETAEGCRQILEQLQPALQTGS
EELRSLYNTVAVLYCVHQRIDVKDTKEALEKIEEEQNKCKKKAQQTAADTGNNSQVSQNYPIVQNMQGQMVHQPISPR
TLNAWVKVIEEKAFSPEVIPMFTALSEGATPHDLNTMLNTIGGHQAAMQMLKDTINEEAAEWDRVHPVHAGPVAPGQM
REPKGSDIAGTTSNLQEQIGWMTHNPPIPVGDIYKRWIIMGLNKIVRMYSPTSILDIKQGPKEPFRDYVDRFFKTLRA
EQASQDVKNWMTETLLVQNSNPDCKTILKALGPGATLEEMMSACQGVGGPSHKARILAEAMSQATNSANIMMQRGNFR
NQRKTVKCFNCGKEGHIAKNCRAPRKRGCWKCGREGHQMKDCNERQANFLGKIWPSYKGRPGNFLQNRPEPTAPPEPT
APPEESFGFGEETTTPPQKQEPIDKDLYPLASLRSLFGNDPSSQ

서열번호: 763
HIV M gag CEN-4 Conserved, Tailored
PIVQNMQGQMVHQPISPRTLNAWVKVIEEKAFSPEVIPMFTALSEGATPHDLNTMLNTIGGHQAAMQMLKDT
INEEAAEWDRVHPVHAGPVAPGQMREPKGSDIAGTTSNLQEQIGWMTHNPPIPVGDIYKRWIIMGLNKIVRMYSPTSI
LDIKQGPKEPFRDYVDRFFKTLRAEQASQDVKNWMTETLLVQNSNPDCKTILKALGPGATLEEMMSACQGVGGPSHKA
RIL

서열번호: 764
HIV M gag CEN-5, Tailored
MGARASILSGGKLDAWERIRLRPGGKKKYRMKHLVWASRELDRFALNPSLLETAEGCQQIMEQLQPALKTGT
EELRSLFNTVATLYCVHQRIDVKDTKEALDKIEEIQNKSKQKTQQAAADTGNSSKVSQNYPIVQNAQGQMIHQSLSPR
TLNAWVKVIEEKAFSPEVIPMFTALSEGATPQDLNMMLNIVGGHQAAMQMLKDTINEEAAEWDRVHPVHAGPIPPGQM
REPRGGDIAGTTSTPQEQIGWMTSNPPIPVGDIYKRWIILGLHKLVRMYSPVSILDIKQGPKEPFRDYVDRFFKTLRA
EQATQEVKGWMTETLLIQNANPDCKSILRALGPGATLEEMMTACQGVGGPSHKARVLAEAMSQVQHTNIMMQRGNFRG
QKRIKCFNCGKEGHLARNCRAPRKRGCWKCGREGHQMKDCNERQANFLGKIWPSSKGRPGNFPQSRPEPTAPQNRLEP
TAPPAEPTAPPAEIFGMGEEITSPPKQEQKDREQAPPLVSLKSLFGNDLLSQ

서열번호: 765
HIV M gag CEN-5 Conserved, Tailored
PIVQNAQGQMIHQSLSPRTLNAWVKVIEEKAFSPEVIPMFTALSEGATPQDLNMMLNIVGGHQAAMQMLKDT
INEEAAEWDRVHPVHAGPIPPGQMREPRGGDIAGTTSTPQEQIGWMTSNPPIPVGDIYKRWIILGLHKLVRMYSPVSI
LDIKQGPKEPFRDYVDRFFKTLRAEQATQEVKGWMTETLLIQNANPDCKSILRALGPGATLEEMMTACQGVGGPSHKA
RVL

[0256]

서열번호: 766
HIV C gag episensus EG-0, Tailored
MGARASILRGGKLDKWEKIRLRPGGKKHYMLKHLVWASRELERFALNPGLLETSEGCKQIMKQLQPALQTGT
EELRSLYNTVATLYCVHEKIEVRDTKEALDKIEEEQNKSQQKTQQAKAADGKVSQNYPIVQNLQGQMVHQAISPRTLN
AWVKVIEEKAFSPEVIPMFTALSEGATPQDLNTMLNTVGGHQAAMQMLKDTINEEAAEWDRLHPVHAGPVAPGQMREP
RGSDIAGTTSTLQEQIAWMTSNPPIPVGDIYKRWIILGLNKIVRMYSPVSILDIKQGPKEPFRDYVDRFFKTLRAEQA
TQDVKNWMTDTLLVQNANPDCKTILRALGPGATLEEMMTACQGVGGPGHKARVLAEAMSQANSNIMMQRSNFKGPKRI
VKCFNCGKEGHIARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSHKGRPGNFLQSRPEPTAPPAEPTAPPA
ESFRFEETTPAPKQEPKDREPLTSLKSLFGSDPLSQ

서열번호: 767
HIV C gag episensus EG-0 Conserved, Tailored
PIVQNLQGQMVHQAISPRTLNAWVKVIEEKAFSPEVIPMFTALSEGATPQDLNTMLNTVGGHQAAMQMLKDT
INEEAAEWDRLHPVHAGPVAPGQMREPRGSDIAGTTSTLQEQIAWMTSNPPIPVGDIYKRWIILGLNKIVRMYSPVSI
LDIKQGPKEPFRDYVDRFFKTLRAEQATQDVKNWMTDTLLVQNANPDCKTILRALGPGATLEEMMTACQGVGGPGHKA
RVL

서열번호: 768
HIV C gag CEN-1, Tailored
MGARASILRGEKLDKWEKIKLRPGGKKRYMLKHLIWASRELERFALNPSLLETSEGCKQIIKQLQPALKTGT
EELRSLFNTVATLYCVHAGIEVRDTKEALDRIEEEQNKCQQKTQQAEAADKGKVSQNYPIVQNAQGQMVHQALSPRTL
NAWVKVVEEKAFSPEIIPMFTALSEGATPSDLNSMLNTVGGHQAAMQMLKDTINDEAAEWDRVHPVHAGPIAPGQMRE
PRGSDIAGTTSNLQEQIAWMTNNPPIPVGEIYKRWIILGLNKIVRMYSPVSILDIRQGPKEPFRDYVDRFFKCLRAEQ
ATQEVKNWMTDTLLIQNANPDCKTILKALGPGASLEEMMTACQGVGGPSHKARVLAEAMSQVNNANIMMQRGNFKGPK
RIIKCFNCGKEGHLARNCRAPRKKGCWKCGQEGHQMKDCSNERQANFLGKLWPSHKGGRPGNFLQNRPEPTAPPVEPT
APPAEPTAPPAESFKFEETTPVPKQELKDREPLISLKSLFGNDPLSQ

서열번호: 769
HIV C gag CEN-1 Conserved, Tailored
IVQNAQGQMVHQALSPRTLNAWVKVVEEKAFSPEIIPMFTALSEGATPSDLNSMLNTVGGHQAAMQMLKDTI
NDEAAEWDRVHPVHAGPIAPGQMREPRGSDIAGTTSNLQEQIAWMTNNPPIPVGEIYKRWIILGLNKIVRMYSPVSIL
DIRQGPKEPFRDYVDRFFKCLRAEQATQEVKNWMTDTLLIQNANPDCKTILKALGPGASLEEMMTACQGVGGPSHKAR
VL

서열번호: 770
HIV C gag CEN-2, Tailored
MGARASILRGEKLDKWERIRLRPGGKKHYMIKHLVWASRELEKFALNPGLLETADGCKQIIKQLHPALQTGT
EELKSLYNTVATLYCVHERIEVRDTKEALDRIEEEQNKCQQKTQQAEAADKGKVSQNYPIVQNAQGQMVHQPISPRTL
NAWVKVVEEKAFSPEIIPMFTALSEGATPTDLNTMLNTIGGHQAAMQILKDTINEEAVEWDRLHPVQAGPVAPGQIRE
PRGSDIAGTTSNLQEQIAWMTGNPPVPVGDIYKRWIIMGLNKIVRMYSPVSILDIRQGPKEPFRDYVDRFFKVLRAEQ
ATQEVKNWMTETLLVQNANPDCKIILKGLGPAATLEEMMTACQGVGGPSHKARVLAEAMSQVNNTNIMMQKSNFKGPK
RTVKCFNCGKEGHIAKNCRAPRKKGCWKCGREGHQMKDCNERQANFLGKIWPSQKGRPGNFLQNRPEPTAPRPEPTAP
PRLEPTAPPAEPSAPPAESFRFEGTTPAPKQESKDREPLISLKSLFGNDPLSQ

서열번호: 771
HIV C gag CEN-2 Conserved, Tailored
PIVQNAQGQMVHQPISPRTLNAWVKVVEEKAFSPEIIPMFTALSEGATPTDLNTMLNTIGGHQAAMQILKDT
INEEAVEWDRLHPVQAGPVAPGQIREPRGSDIAGTTSNLQEQIAWMTGNPPVPVGDIYKRWIIMGLNKIVRMYSPVSI
LDIRQGPKEPFRDYVDRFFKVLRAEQATQEVKNWMTETLLVQNANPDCKIILKGLGPAATLEEMMTACQGVGGPSHKA
RVL

[0257]

서열번호: 772
HIV C gag CEN-3, Tailored
MGARASILRGEKLDRWERIRLRPGGKKCYMLKHIVWASRELERFSLNPGLLETAEGCKQIIKQLHPALQTGT
EELKSLFNTVATLYCVHKKIDVRDTKEALDKVEEEQNKCQQKTQQAKAADEKVSQNYPIVQNIQGQMVHQALSPRTLN
AWVKVVEEKAFSPEIIPMFTALSEEATPQDLNTMLNAVGGHQAAMQMLKETINEEAAEWDRVHPVHAGPIAPGQMREP
RGSDIAGTTSNLQEQIAWMTNNPPIPVGEIYKRWIILGLNKIVRMYSPVSILDIRQGPKEPFRDYVDRFFRVLRAEQA
TQEVKNWMTDTLLIQNANPDCKTILKALGPGASLEEMMTACQGVGGPSHKARVLAEAMSQANNINIMMQRGNFKGPKR
TVKCFNCGKEGHIAKNCRAPRKRGCWKCGKEGHQMKDCNERQANFLGRIWPSHKGRPGNFLQNRPEPTAPSAESFRQN
RTEPTAPPARLEPTAPPAEPSAPPVESFRFEETTPALKQESKDREPLTSLRSLFGSDPLFQ

서열번호: 773
HIV C gag CEN-3 Conserved, Tailored
PIVQNIQGQMVHQALSPRTLNAWVKVVEEKAFSPEIIPMFTALSEEATPQDLNTMLNAVGGHQAAMQMLKET
INEEAAEWDRVHPVHAGPIAPGQMREPRGSDIAGTTSNLQEQIAWMTNNPPIPVGEIYKRWIILGLNKIVRMYSPVSI
LDIRQGPKEPFRDYVDRFFRVLRAEQATQEVKNWMTDTLLIQNANPDCKTILKALGPGASLEEMMTACQGVGGPSHKA
RVL

서열번호: 774
HIV C gag CEN-4, Tailored
MGARASVLRGEKLDKWERIRLRPGGKKQYMLKHIVWASRELEKFALNPGLLETAEGCKQIIKQLHPALQTGT
EELRSLFNTVATLYCVHKGIDVRDTKEALDKVEEEQNKCQQKTQQAEADKKVSQNYPIVQNIQGQMVHQPLSPRTLNA
WVKVVEEKAFSPEVIPMFSALSEGATPGDLNTMLNTIGGHQAAMQMLKDTINDEAAEWDRLHPVHAGPIAPGQMREPR
GSDIAGTTSNLQEQIAWMTNNPPVPVGEIYKRWIVLGLNKIVRMYSPVSILDIRQGPKEPFRDYVDRFFRTLRAEQAT
QEVKNWMTETLLVQNANPDCKNILRALGPGASLEEMMTACQGVGGPSHKARVLAEAMSQANNTNIMMQKSNFKGPRRI
VKCFNCGKEGHIAKNCRAPRKRGCWKCGKEGHQMKDCNERQANFLGKIWPSNKGRPGNFLQNRPEPTAPQSRPEPTAP
LEPTAPPAEPTAPPAESFKFEETTPAPKQEQKDREPLISLKSLFGNDPLSQ

서열번호: 775
HIV C gag CEN-4 Conserved, Tailored
PIVQNIQGQMVHQPLSPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPGDLNTMLNTIGGHQAAMQMLKDT
INDEAAEWDRLHPVHAGPIAPGQMREPRGSDIAGTTSNLQEQIAWMTNNPPVPVGEIYKRWIVLGLNKIVRMYSPVSI
LDIRQGPKEPFRDYVDRFFRTLRAEQATQEVKNWMTETLLVQNANPDCKNILRALGPGASLEEMMTACQGVGGPSHKA
RVL

서열번호: 776
HIV C gag CEN-5, Tailored
MGARASVLRGEKLDKWERIRLRPGGKKRYMLKHIVWASRELEKFALNPGLLETAEGCKQIIKQLQPALQTGT
EELKSLFNTVATLYCVHEKIDVRDTKEALDRIEEEQNKCQQKTQQAKAADEKVSQNYPIVQNAQGQMVHQALSPRTLN
AWVKVIEEKGFNPEVIPMFTALSDGATPQDLNSMLNTVGGHQAAMQILKDTINEEAAEWDRVHPVHAGPIAPGQMREP
RGSDIAGTTSNLQEQIAWMTGNPPIPVGEIYKRWIILGLNKIVRMYSPVSILDIRQGPKEPFRDYVDRFFKALRAEQA
TQEVKNWMTETLLVQNANPDCKNILRALGPGASLEEMMTACQGVGGPSHKARVLAEAMSQANNTNIMMQRNNFKGPKR
IIKCFNCGKEGHIAKNCRAPRKKGCWKCGREGHQMKDCNERQANFLGRIWPSHKGGRPGNFLQNRPEPTAPPVEPTAP
PAEPTAPPAESFKFEETTPTPKQEQKDREPLISLKSLFGNDPLSQ

서열번호: 777
HIV C gag CEN-5 Conserved, Tailored
PIVQNAQGQMVHQALSPRTLNAWVKVIEEKGFNPEVIPMFTALSDGATPQDLNSMLNTVGGHQAAMQILKDT
INEEAAEWDRVHPVHAGPIAPGQMREPRGSDIAGTTSNLQEQIAWMTGNPPIPVGEIYKRWIILGLNKIVRMYSPVSI
LDIRQGPKEPFRDYVDRFFKALRAEQATQEVKNWMTETLLVQNANPDCKNILRALGPGASLEEMMTACQGVGGPSHKA
RVL

[0258]

서열번호: 778
HIV B gag episensus EG-0, Tailored
MGARASVLSGGELDRWEKIRLRPGGKKKYKLKHIVWASRELERFAVNPGLLETSEGCRQILGQLQPSLQTGS
EELKSLYNTVATLYCVHQKIDVKDTKEALDKIEEEQNKSKKKAQQAAADTGNSSQVSQNYPIVQNLQGQMVHQAISPR
TLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDLNTMLNTVGGHQAAMQMLKETINEEAAEWDRLHPVHAGPIAPGQM
REPRGSDIAGTTSTLQEQIGWMTNNPPIPVGEIYKRWIILGLNKIVRMYSPTSILDIRQGPKEPFRDYVDRFYKTLRA
EQASQEVKNWMTETLLVQNANPDCKTILKALGPAATLEEMMTACQGVGGPGHKARVLAEAMSQVTNSATIMMQRGNFR
NQRKTVKCFNCGKEGHIARNCRAPRKKGCWKCGKEGHQMKDCTERQANFLGKIWPSHKGRPGNFLQSRPEPTAPPEPT
APPEESFRFGEETTTPSQKQEPIDKELYPLASLKSLFGNDPSSQ

서열번호: 779
HIV B gag episensus EG-0 Conserved, Tailored
PIVQNLQGQMVHQAISPRTLNAWVKVVEEKAFSPEVIPMFSALSEGATPQDLNTMLNTVGGHQAAMQMLKET
INEEAAEWDRLHPVHAGPIAPGQMREPRGSDIAGTTSTLQEQIGWMTNNPPIPVGEIYKRWIILGLNKIVRMYSPTSI
LDIRQGPKEPFRDYVDRFYKTLRAEQASQEVKNWMTETLLVQNANPDCKTILKALGPAATLEEMMTACQGVGGPGHKA
RVL

서열번호: 780
HIV B gag CEN-1, Tailored
MGSRASVLSGGKLDQWEKIRLRPGGKKRYKLKHLVWASRELERFAVNPSLLETSEGCKQILGQLQPALQTGS
EELRSLYNTIAVLYCVHQRIEVKDTKEALEKIEEEQNKCKKKAQQAAAAAADTGNSNQVSQNYPIVQNMQGQMVHQAL
SPRTLNAWVKVIEEKAFSPEVIPMFTALSEGATPADLNTMLNTIGGHQAAMQILKETINEEAAEWDRVHPVHAGPVAP
GQMREPRGSDIAGSTSTLQEQIAWMTSNPPIPVGDIYKRWIIMGLNKIVRMYSPTSILDIKQGPKEPFRDYVDRFYKT
LRAEQATQEVKNWMTETLLVQNSNPDCKTILKALGPGATLEEMMTACQGVGGPSHKARVLAEAMSQVTTPPAIMMQRG
NFKNQRKIVKCFNCGKEGHLARNCRAPRKRGCWKCGREGHQMKDCSERQANFLGKIWPSYKGRPGNFLQNRPEPTAPP
AEPTAPPAESFRFGEETATPPQKQEPIDKEMYPLTSLRSLFGNDPSQ

서열번호: 781
HIV B gag CEN-1 Conserved, Tailored
PIVQNMQGQMVHQALSPRTLNAWVKVIEEKAFSPEVIPMFTALSEGATPADLNTMLNTIGGHQAAMQILKET
INEEAAEWDRVHPVHAGPVAPGQMREPRGSDIAGSTSTLQEQIAWMTSNPPIPVGDIYKRWIIMGLNKIVRMYSPTSI
LDIKQGPKEPFRDYVDRFYKTLRAEQATQEVKNWMTETLLVQNSNPDCKTILKALGPGATLEEMMTACQGVGGPSHKA
RVL

서열번호: 782
HIV B gag CEN-2, Tailored
MGSRASVLSGGKLDKWEKIRLRPGGKKKYRLKHLVWASRELERYALNPGLLETAEGCRQILGQLQPALQTGS
EELKSLFNTVAVLYCVHQRIDVKDTKEALEKIEEEQNKSKKKTQQAAADTGNNSQVKVSQNYPIVQNIQGQMVHQALS
PRTLNAWVKVIEEKAFSPEVIPMFTALSEGATPHDLNTMLNTIGGHQAAMQILKETINDEAAEWDRTHPVHAGPVAPG
QMRDPRGSDIAGTTSNLQEQIGWMTHNPPIPVGDIYKRWIIMGLNKIVRMYSPVSILDIKQGPKEPFRDYVDRFYKIL
RAEQASQDVKNWMTETLLVQNSNPDCKTILKALGPGATLEEMMTACQGVGGPSHKARVLAEAMSQMTNSATIMMQKGN
FRNQRKTIKCFNCGKEGHLARNCRAPRKRGCWKCGQEGHQMKDCNERQANFLGKIWPSSKGRPGNFLQSRPESRPEPT
APPAEPTAPPAESFRFGEETATPPQKQEPIDKEMYPLASLRSLFGNDPSSK

서열번호: 783
HIV B gag CEN-2 Conserved, Tailored
PIVQNIQGQMVHQALSPRTLNAWVKVIEEKAFSPEVIPMFTALSEGATPHDLNTMLNTIGGHQAAMQILKET
INDEAAEWDRTHPVHAGPVAPGQMRDPRGSDIAGTTSNLQEQIGWMTHNPPIPVGDIYKRWIIMGLNKIVRMYSPVSI
LDIKQGPKEPFRDYVDRFYKILRAEQASQDVKNWMTETLLVQNSNPDCKTILKALGPGATLEEMMTACQGVGGPSHKA
RVL

[0259]

서열번호: 784
HIV B gag CEN-3, Tailored
MGARASILSGGELDKWEKIRLRPGGKKQYKLKHIVWASRELERFALNPGLLETSGGCRQILEQLQPALQTGS
EELRSLYNTVAVLYCVHQRIEVKDTKEALEKIEEEQNKCKKKAQQAAAAAADTGNNSQVSQNYPIVQNIQGQMVHQAL
SPRTLNAWVKVIEEKAFSPEVIPMFTALSEGATPGDLNLMLNAVGGHQAAMQMLKDTINEEAADWDRLHPVQAGPVAP
GQLREPRGSDIAGTTSNLQEQIAWMTHNPPIPVGEIYKRWIIMGLNKIVRMYSPVSILDIKQGPKEPFRDYVDRFYRT
LRAEQASQDVKNWMTETLLIQNANPDCRTILKALGPGATLEEMMTACQGVGGPSHKARVLAEAMSQATSSATIMMQKG
NFRNQRKIVKCFNCGKEGHIAKNCRAPRKRGCWKCGREGHQMKDCSERQANFLGKIWPSYKGRPGNFLQNRPEPTAPP
AEPTAPPAESFRFGEETTTPPQKQEPTDKELYPLASLRSLFGNDPLSQ

서열번호: 785
HIV B gag CEN-3 Conserved, Tailored
PIVQNIQGQMVHQALSPRTLNAWVKVIEEKAFSPEVIPMFTALSEGATPGDLNLMLNAVGGHQAAMQMLKDT
INEEAADWDRLHPVQAGPVAPGQLREPRGSDIAGTTSNLQEQIAWMTHNPPIPVGEIYKRWIIMGLNKIVRMYSPVSI
LDIKQGPKEPFRDYVDRFYRTLRAEQASQDVKNWMTETLLIQNANPDCRTILKALGPGATLEEMMTACQGVGGPSHKA
RVL

서열번호: 786
HIV B gag CEN-4, Tailored
MGARASILSGGELDKWEKIRLRPGGKKKYRLKHIVWASNELERFALNPGLLETSDGCRQILGQLHPSLQTGS
EELRSLYNTVAVLYCVHQRIEIKDTKEALEKIEEEQNKCKKKAQQAAAAQQAAAGTGNNSQVSQNYPIVQNMQGQMVH
QALSPRTLNAWVKVIEEKAFSPEVIPMFTALSEGATPHDLNTMLNTIGGHQAAMQILKETINEEAAEWDRVHPVHAGP
IAPGQIREPRGSDIAGTTSNLQEQIGWMTHNPPIPVGEIYKKWIIMGLNKIVRMYSPVSILDIKQGPKEPFRDYVDRF
YKTLRAEQATQEVKNWMTETLLVQNSNPDCKTILKALGPGATLEEMMTACQGVGGPAHKARVLAEAMSQATNSAAIMM
QKGNFRNQRRTVKCFNCGKEGHIAKNCRAPRKKGCWKCGQEGHQMKDCNERQANFLGRSWPSLKGRPGNFLQNRPEPS
APPEESFKFGEETTTPPQKQEPIDKDLYPLASLRSLFGNDPSST

서열번호: 787
HIV B gag CEN-4 Conserved, Tailored
PIVQNMQGQMVHQALSPRTLNAWVKVIEEKAFSPEVIPMFTALSEGATPHDLNTMLNTIGGHQAAMQILKET
INEEAAEWDRVHPVHAGPIAPGQIREPRGSDIAGTTSNLQEQIGWMTHNPPIPVGEIYKKWIIMGLNKIVRMYSPVSI
LDIKQGPKEPFRDYVDRFYKTLRAEQATQEVKNWMTETLLVQNSNPDCKTILKALGPGATLEEMMTACQGVGGPAHKA
RVL

서열번호: 788
HIV B gag CEN-5, Tailored
MGSRASVLSGGKLDKWEKIRLRPGGKKKYQLKHIVWASRELERYALNPGLLETAEGCRQILEQLQPALQTGS
EELRSLYNTVAVLYCVHQKIEVKDTKEALEKVEEEQNKSKKRIQQAQQAAAADTGNSSKVSQNYPIVRNLQGQMVHQP
ISPRTLNAWVKVIEEKAFSPEVIPMFSALAEGATPQDLNLMLNAVGGHQAAMQMLKDTINEEAAEWDRMHPVHAGPVA
PGQMREPRGSDIAGTTSNLQEQIGWMTSNPPIPVGEIYKRWIIMGLNKIVRMYSPVSILDIKQGPKEPFRDYVDRFYR
TLRAEQASQDVKNWMTETLLVQNSNPDCKTILKALGPGATLEEMMTACQGVGGPSHKARVLAEAMSQVTNSTAIMMQR
GNFKNQRKIVKCFNCGKEGHIAKNCRAPRKRGCWKCGREGHQMKECTERQVNFLGKIWPSYKGRPGNFLQNRPEPTAP
PAPPEESFRFGEGTTTPSQKQGTIDKELYPLTSLRSLFGNDPS

서열번호: 789
HIV B gag CEN-5 Conserved, Tailored
PIVRNLQGQMVHQPISPRTLNAWVKVIEEKAFSPEVIPMFSALAEGATPQDLNLMLNAVGGHQAAMQMLKDT
INEEAAEWDRMHPVHAGPVAPGQMREPRGSDIAGTTSNLQEQIGWMTSNPPIPVGEIYKRWIIMGLNKIVRMYSPVSI
LDIKQGPKEPFRDYVDRFYRTLRAEQASQDVKNWMTETLLVQNSNPDCKTILKALGPGATLEEMMTACQGVGGPSHKA
RVL

[0260]

서열번호: 790
VTSSNMNNA

서열번호: 791
TSSNMNNAD

서열번호: 792
TSSNMNNADSVWLRAQEEE

서열번호: 793
TSSNMNNADCVWLRAQEEE

서열번호: 794
ARCHSLM

서열번호: 795
DEFGKLM

서열번호: 796
EPTAPPAEPTAP

서열번호: 797
PTAPPAEPTAPP

서열번호: 798
EPTAPPAEPTAPP

서열번호: 799
ARCGSLM

서열번호: 800
ARCGSPM

서열번호: 801
ARYGSLM

서열번호: 802
AYCHSLM

서열번호: 803
YRCHSLM

서열번호: 804
DEFGSLM

서열번호: 805
DEFGKLM

서열번호: 806
ARCCDEGH

서열번호: 807
ARCDEFGH

서열번호: 808
ARCCDE-GH

[0261]

서열번호: 809
ARC-DEFGH

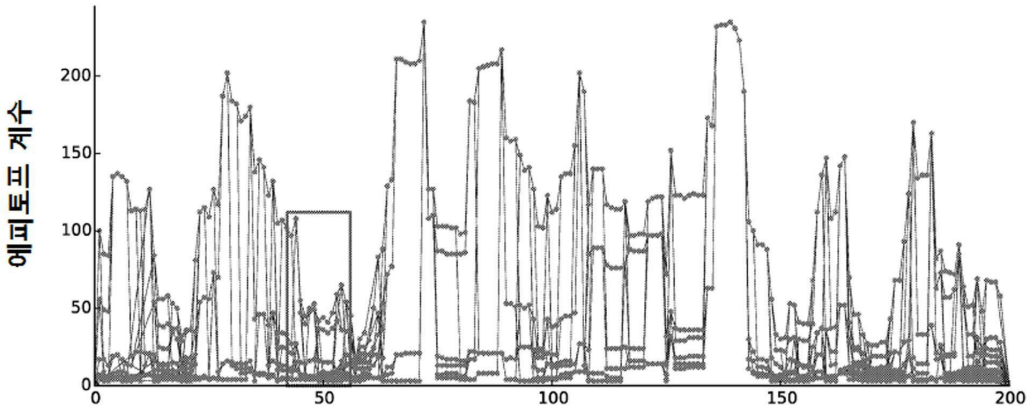
서열번호: 810
DECHJLM

서열번호: 811
DEFGJLM

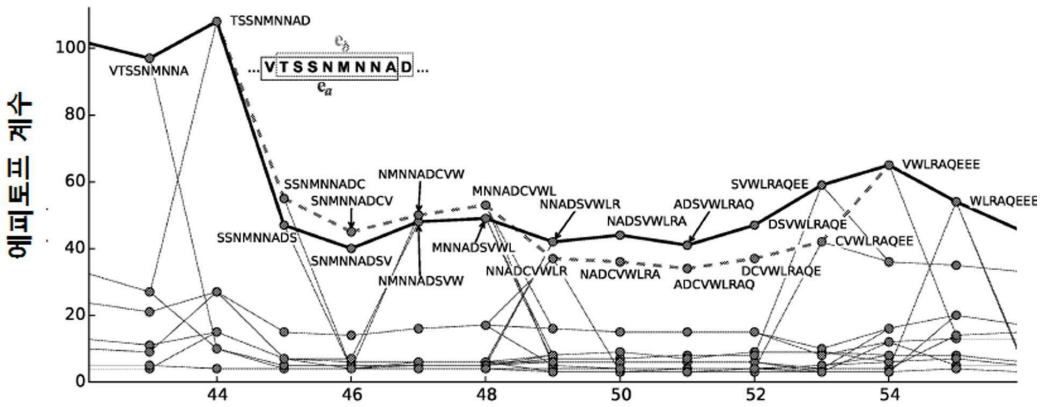
[0262]

도면

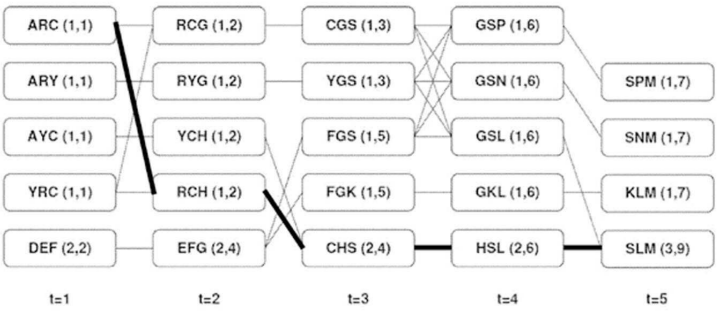
도면1a



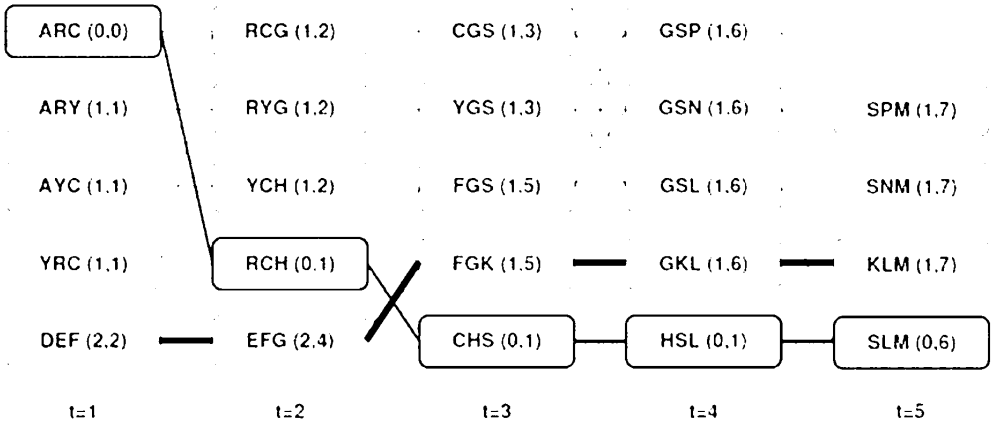
도면1b



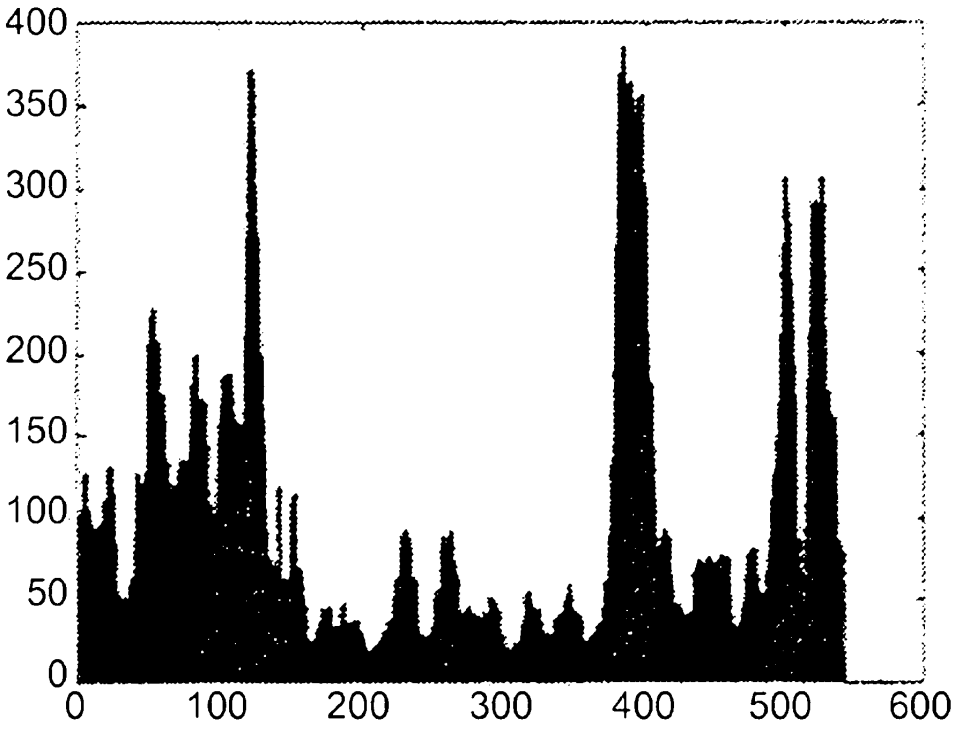
도면2



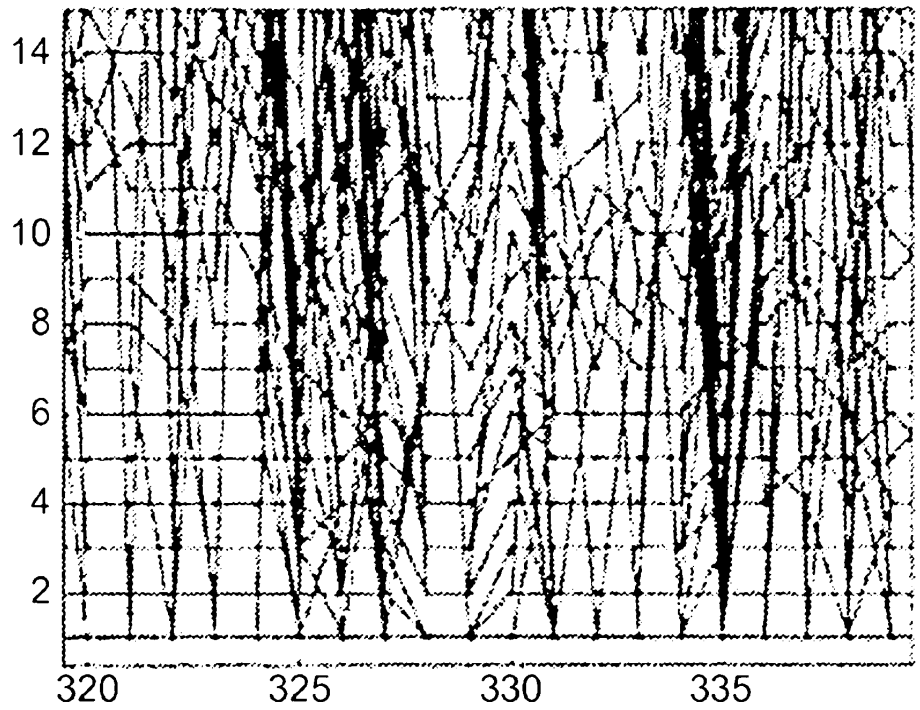
도면3


ARC (0.0)
RCG (1.2)
CGS (1.3)
GSP (1.6)
ARY (1.1)
RYG (1.2)
YGS (1.3)
GSN (1.6)
SPM (1.7)
AYC (1.1)
YCH (1.2)
FGS (1.5)
GSL (1.6)
SNM (1.7)
YRC (1.1)
RCH (0.1)
FGK (1.5)
GKL (1.6)
KLM (1.7)
DEF (2.2)
EFG (2.4)
CHS (0.1)
HSL (0.1)
SLM (0.6)
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t=2
t=3
t=4
t=5

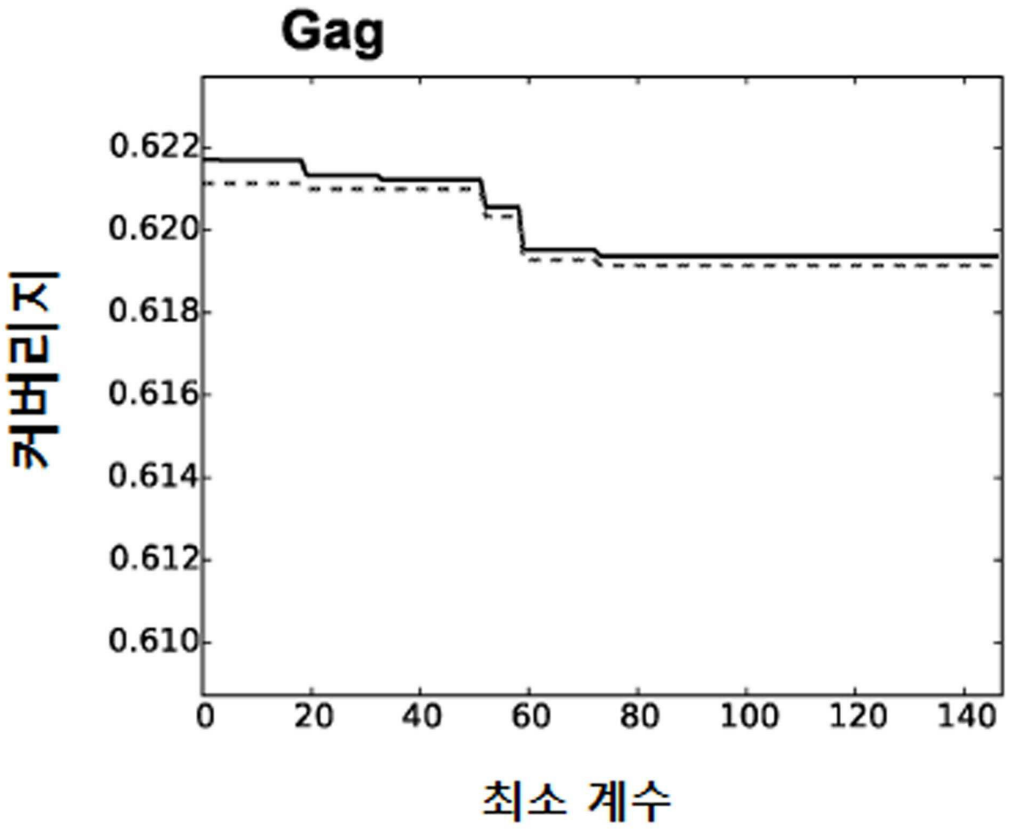
도면4a


400
350
300
250
200
150
100
50
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100
200
300
400
500
600

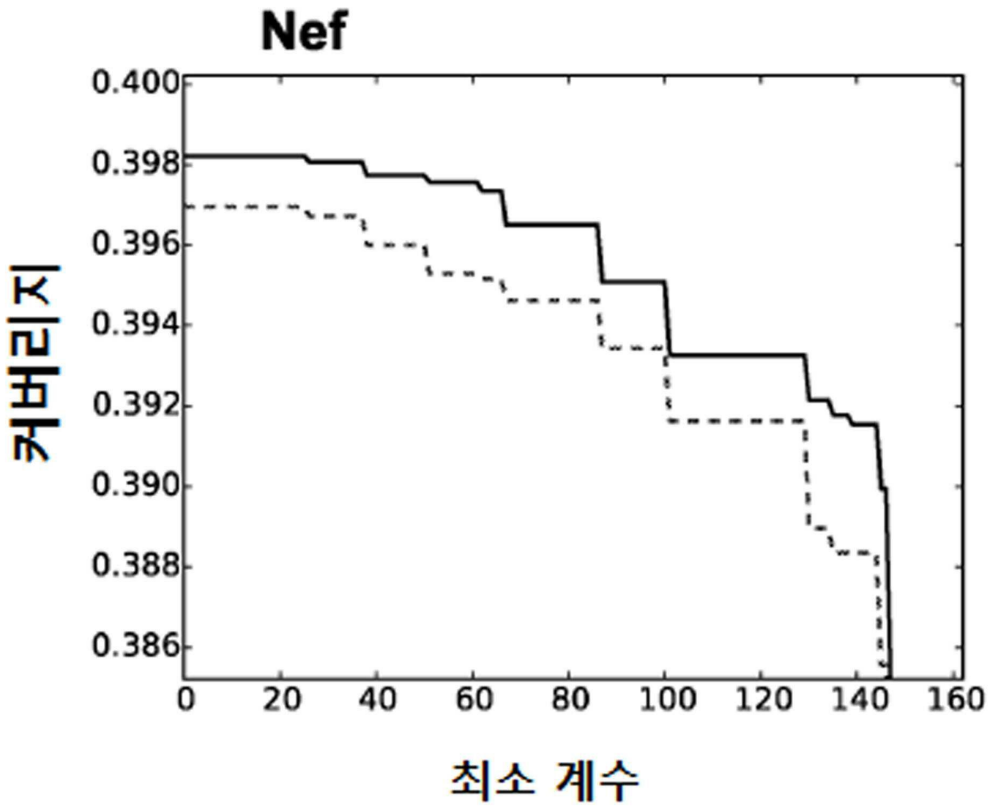
도면4b


14
12
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2
320
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330
335

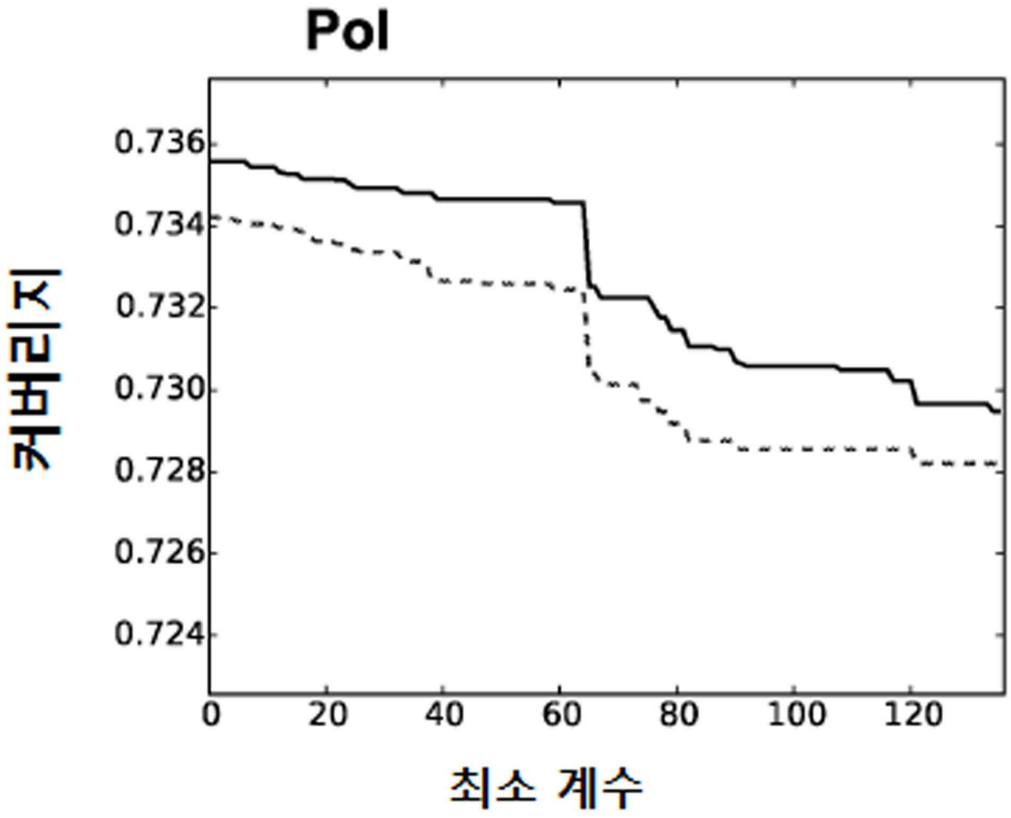
도면5a


Gag
커버리지
0.622
0.620
0.618
0.616
0.614
0.612
0.610
0
20
40
60
80
100
120
140
최소 계수

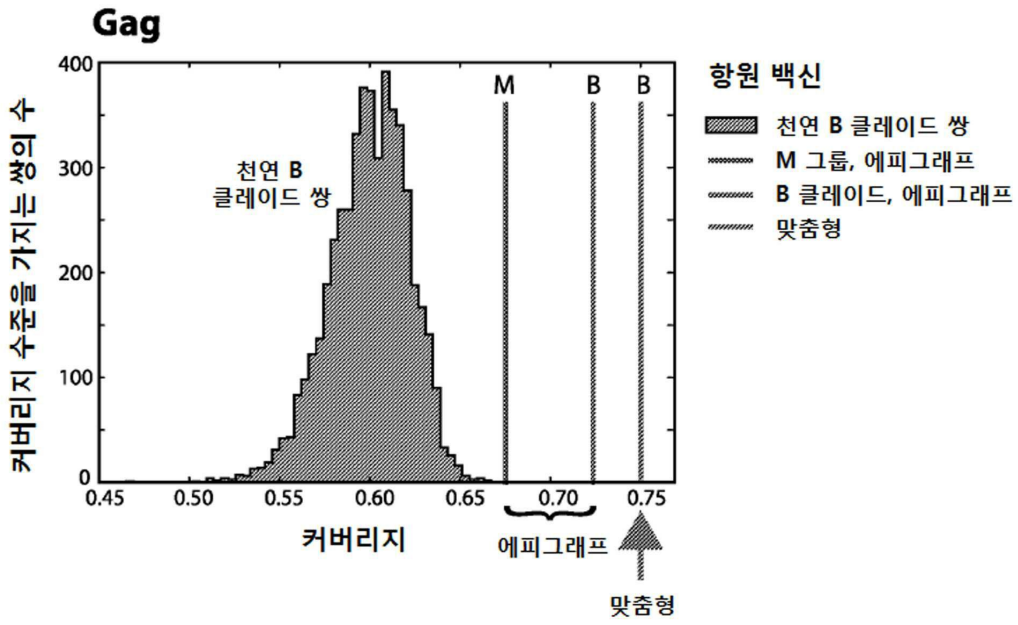
도면5b


Nef
0.400
0.398
0.396
0.394
0.392
0.390
0.388
0.386
커버리지
0
20
40
60
80
100
120
140
160
최소 계수

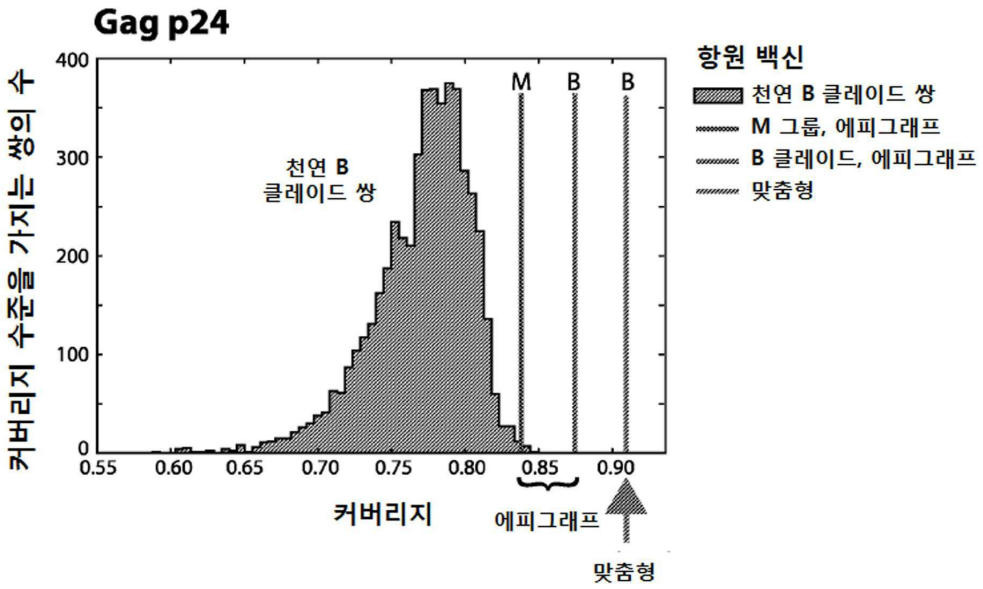
도면5c


Pol
커버리지
0.736
0.734
0.732
0.730
0.728
0.726
0.724
0
20
40
60
80
100
120
최소 계수

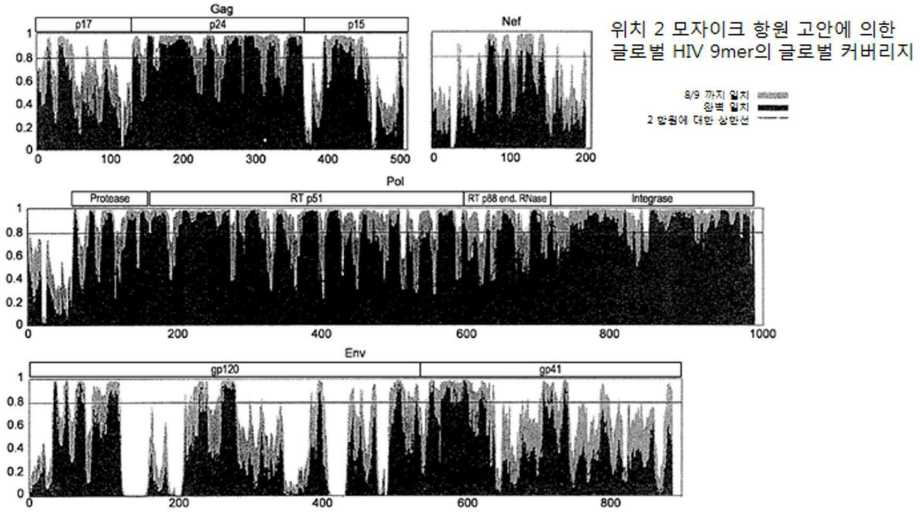
도면6a


Gag
커버리지 수준을 가지는 쌍의 수
400
300
200
100
0
천연 B
클레이드 쌍
M
B
B
0.45
0.50
0.55
0.60
0.65
0.70
0.75
커버리지
에피그래프
맞춤형
항원 백신
천연 B 클레이드 쌍
M 그룹, 에피그래프
B 클레이드, 에피그래프
맞춤형

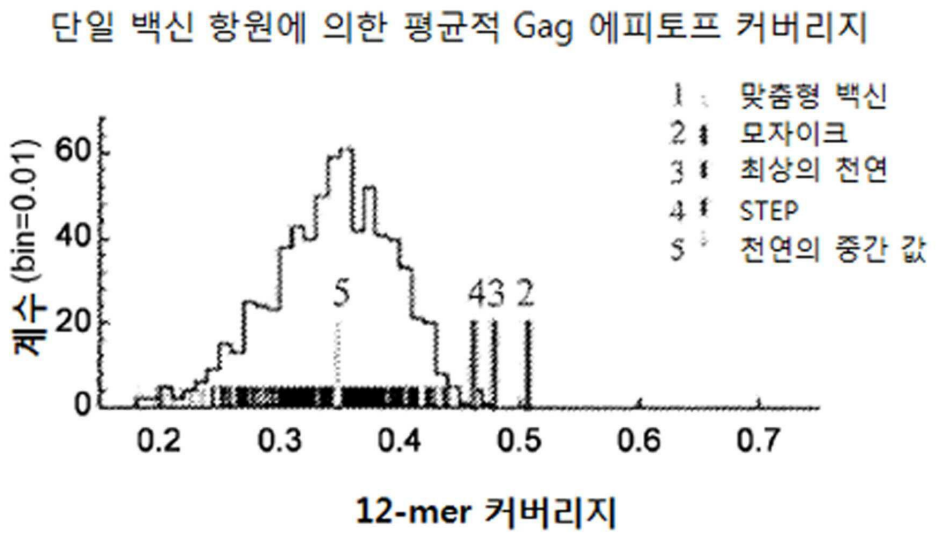
도면6b


Gag p24
커버리지 수준을 가지는 쌍의 수
400
300
200
100
0
0.55
0.60
0.65
0.70
0.75
0.80
0.85
0.90
M
B
B
천연 B
클레이드 쌍
커버리지
에피그래프
맞춤형
항원 백신
천연 B 클레이드 쌍
M 그룹, 에피그래프
B 클레이드, 에피그래프
맞춤형

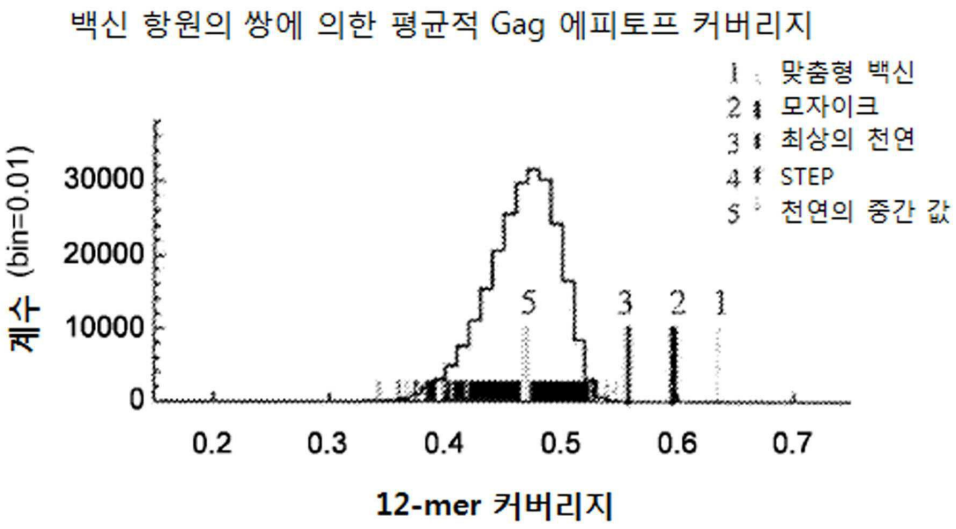
도면7


Gag
p17
p24
p15
Nef
위치 2 모자이크 항원 고안에 의한
글로벌 HIV 9mer의 글로벌 커버리지
Pol
Protease
RT p51
RT p66 end. RNase
Integrase
Env
gp120
gp41

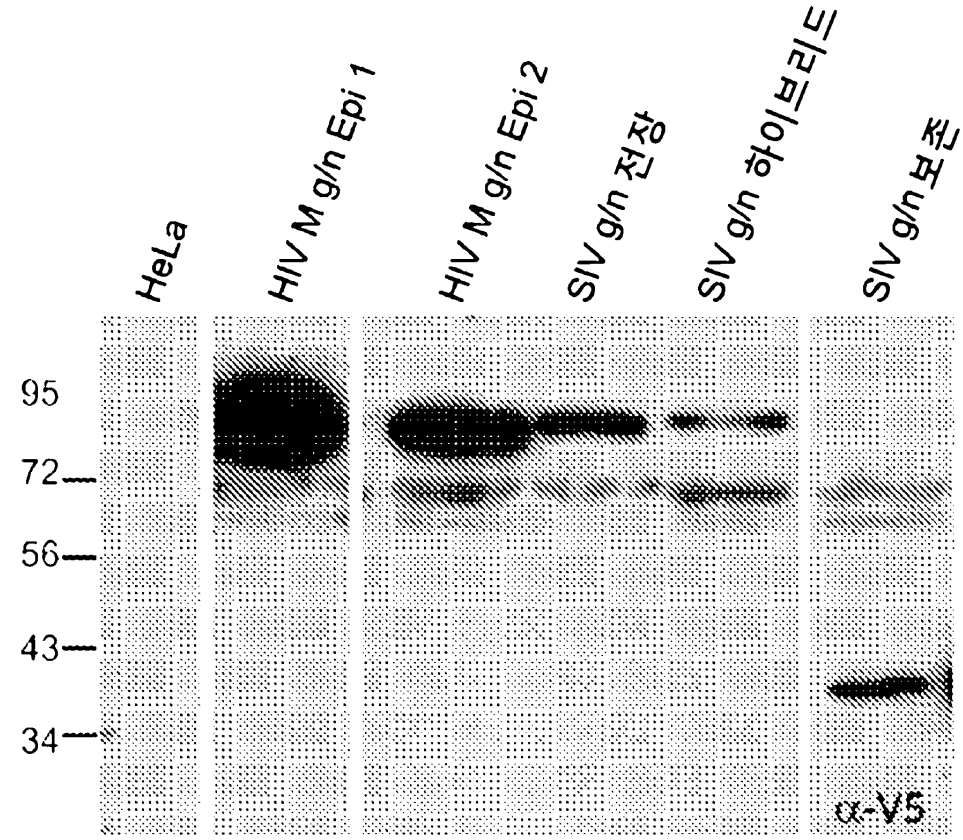
도면8a


단일 백신 항원에 의한 평균적 Gag 에피토프 커버리지
1 맞춤형 백신
2 모자이크
3 최상의 천연
4 STEP
5 천연의 중간 값
계수 (bin=0.01)
60
40
20
0
5
4 3 2
0.2
0.3
0.4
0.5
0.6
0.7
12-mer 커버리지

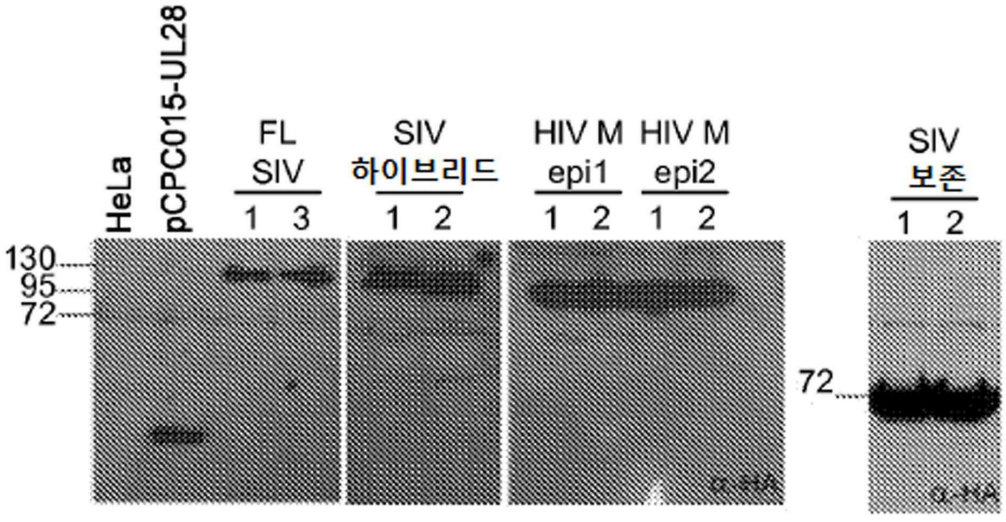
도면8b


백신 항원의 쌍에 의한 평균적 Gag 에피토프 커버리지
1 맞춤형 백신
2 모자이크
3 최상의 천연
4 STEP
5 천연의 중간 값
계수 (bin=0.01)
30000
20000
10000
0
5
3
2
1
0.2
0.3
0.4
0.5
0.6
0.7
12-mer 커버리지

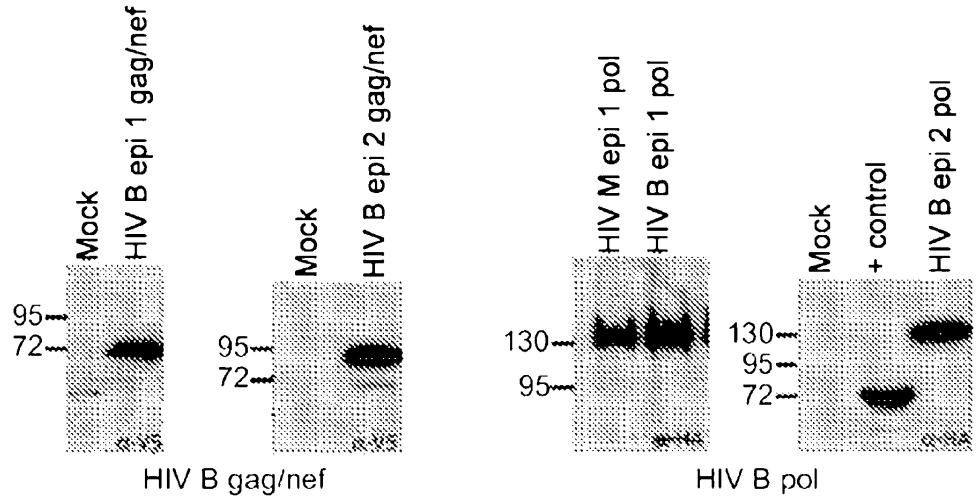
도면9a


HeLa
HIV M g/n Epi 1
HIV M g/n Epi 2
SIV g/n 전장
SIV g/n 하이브리드
SIV g/n 보존
95
72
56
43
34
α-V5

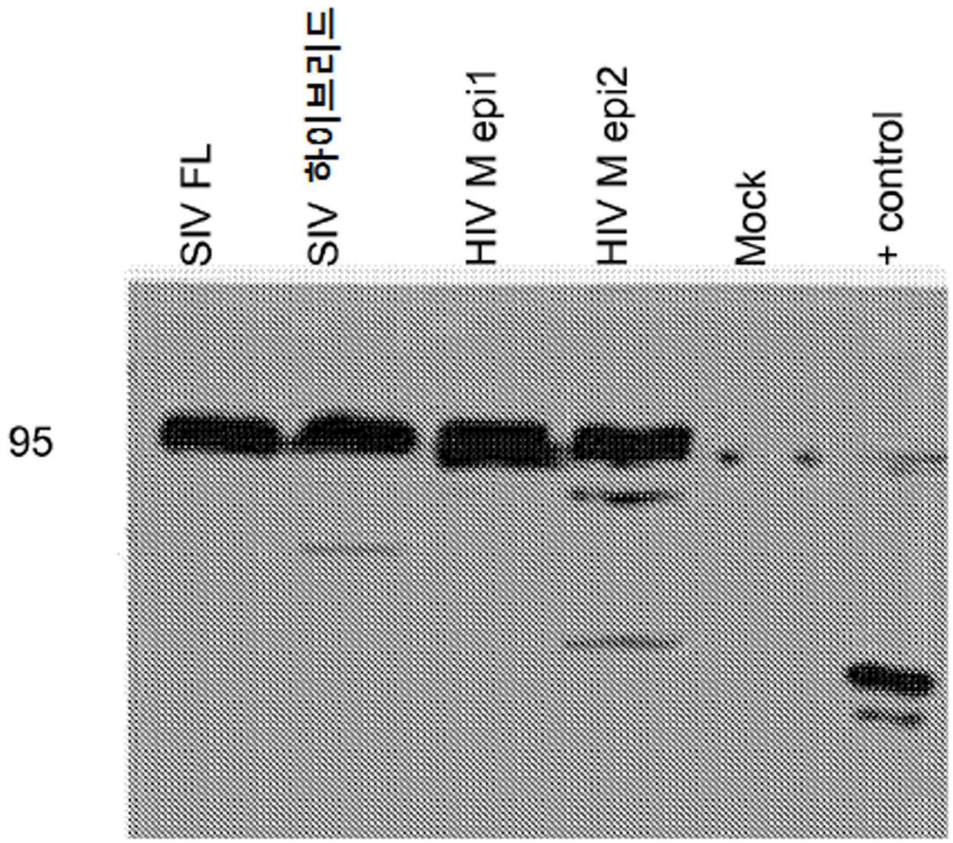
도면9b


HeLa
pCPC015-UL28
FL SIV
1 3
SIV 하이브리드
1 2
HIV M epi1
1 2
HIV M epi2
1 2
SIV 보존
1 2
130
95
72
72
α-HA
α-HA

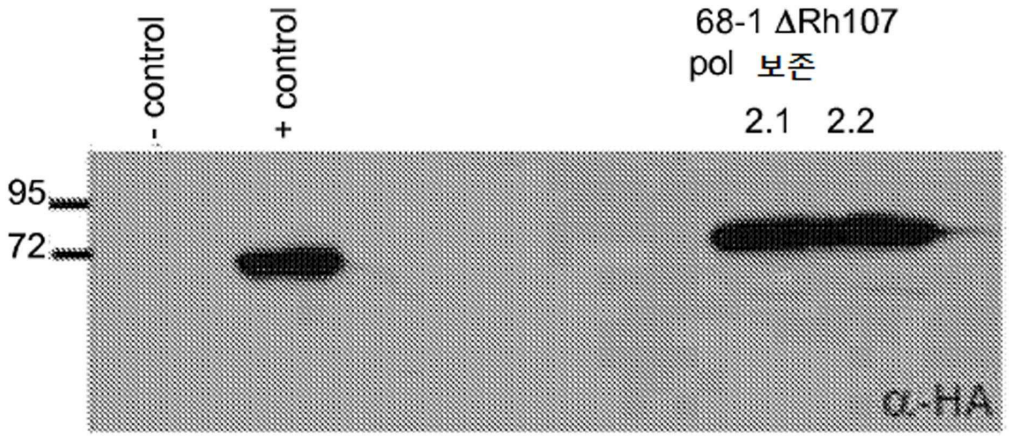
도면9c


Mock
HIV B epi 1 gag/nef
95
72
Mock
HIV B epi 2 gag/nef
95
72
HIV B gag/nef
HIV M epi 1 pol
HIV B epi 1 pol
130
95
Mock
+ control
HIV B epi 2 pol
130
95
72
HIV B pol

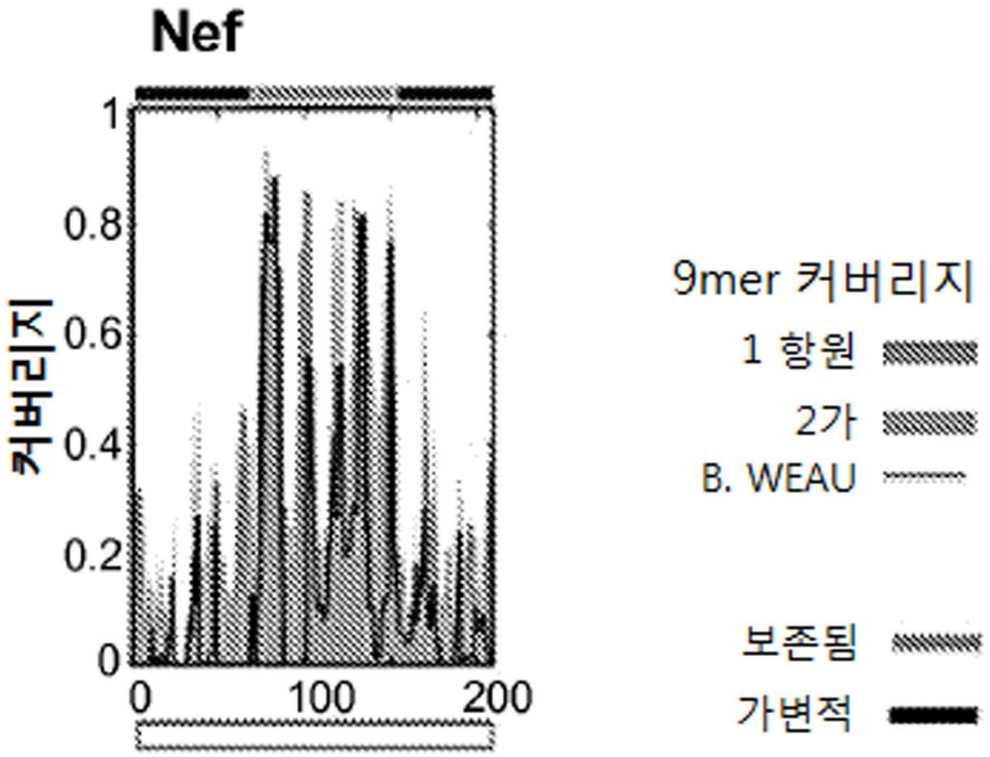
도면10a


SIV FL
SIV 하이브리드
HIV M epi1
HIV M epi2
Mock
+ control
95

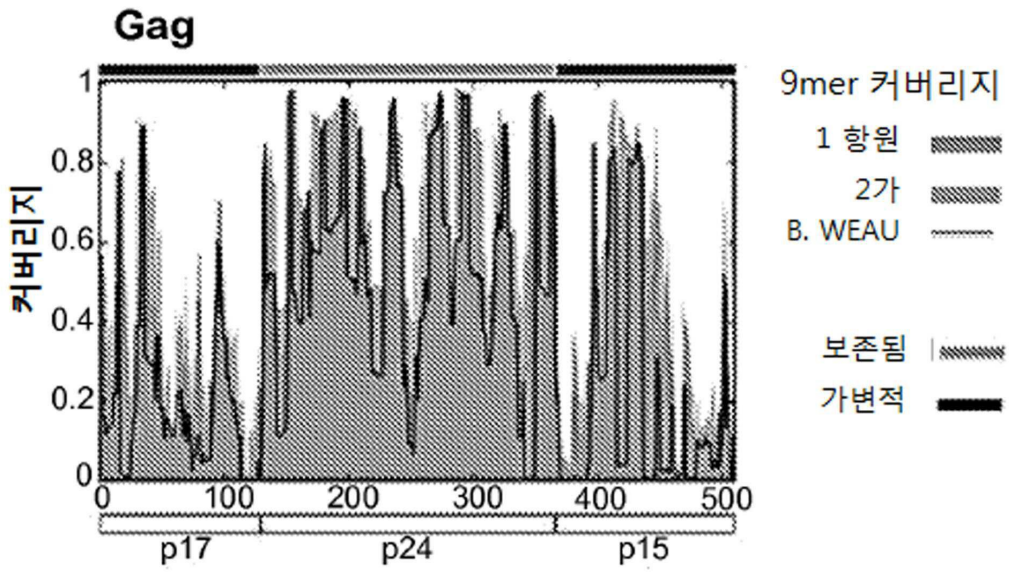
도면10b


- control
+ control
68-1 ΔRh107
pol 보존
2.1 2.2
95
72
α-HA

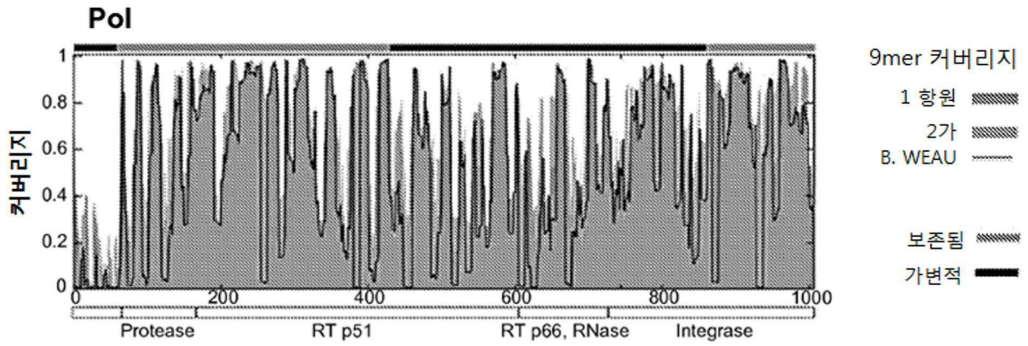
도면11a


Nef
1
0.8
0.6
0.4
0.2
0
커버리지
0
100
200
9mer 커버리지
1 항원
2가
B. WEAU
보존됨
가변적

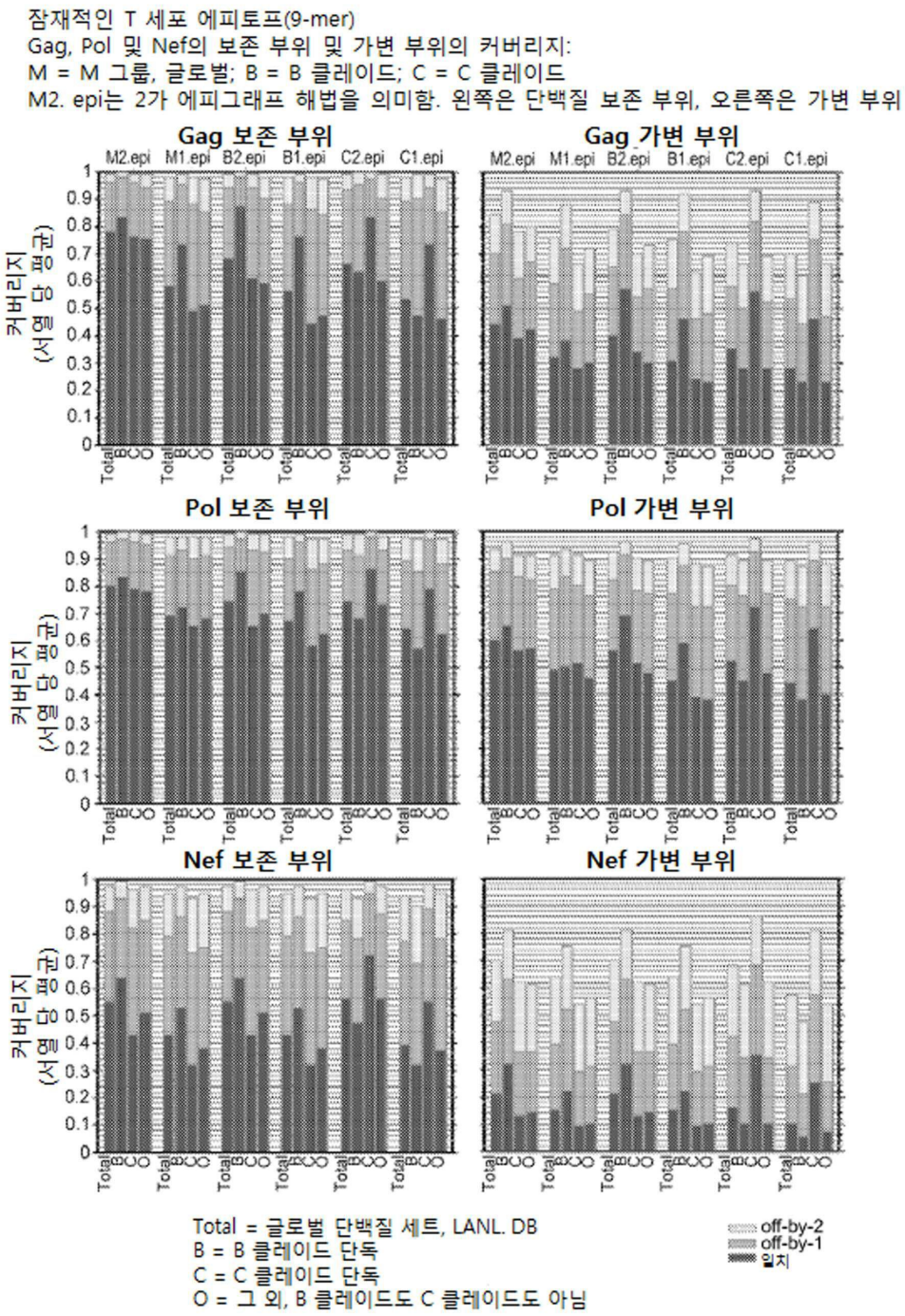
도면11b


Gag
커버리지
1
0.8
0.6
0.4
0.2
0
0
100
200
300
400
500
p17
p24
p15
9mer 커버리지
1 항원
2가
B. WEAU
보존됨
가변적

도면11c


Pol
커버리지
1
0.8
0.6
0.4
0.2
0
0
200
400
600
800
1000
Protease
RT p51
RT p66, RNase
Integrase
9mer 커버리지
1 항원
2가
B. WEAU
보존됨
가변적

도면12



서 열 목 록

SEQUENCE LISTING

<110> LOS ALAMOS NATIONAL SECURITY, LLC.

OREGON HEALTH & SCIENCE UNIVERSITY

VIR BIOTECHNOLOGY, INC.

<120> HIV VACCINES COMPRISING ONE OR MORE POPULATION EPISENSUS ANTIGENS

<130> IPA170423-US

<150> 62/059,497

<151> 2014-10-03

<150> 62/059,506

<151> 2014-10-03

<160> 809

<170> PatentIn version 3.5

<210> 1

<211> 500

<212> PRT

<213> Human immunodeficiency virus

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Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly His Ser Asn Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205
Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400
Thr Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Ser Gly Val Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp

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Pro Ser Ser Gln

500

<210> 2

<211> 503

<212> PRT

<213> Human immunodeficiency virus

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<400> 2

Met Gly Ala Arg Ala Ser Xaa Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30
His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Lys Ile Ile Ala Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Ile Tyr Cys Val His Gln Arg Ile Glu Val Lys Xaa
85 90 95
Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Glu Ala Gly Thr Gly Asn Asn Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Val

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys His Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ile Asn Xaa Ala Thr Val Met Xaa Gln Lys Gly Asp Tyr Arg Asn

370 375 380

Gln Arg Arg Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile

385 390 395 400

Ala Lys Asn Cys Arg Ala Pro Xaa Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415

Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro Glu Glu Ile

450 455 460

Phe Arg Phe Gly Glu Glu Thr Ala Pro Ser Gln Lys Gln Glu Arg Thr

465 470 475 480

Asp Arg Asp Lys Glu Leu Tyr Pro Ser Ala Ala Leu Arg Ser Leu Phe

485 490 495

Gly Asn Asp Pro Leu Ser Gln

500

<210> 3

<211> 500

<212> PRT

<213> Human immunodeficiency virus

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<400> 3

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Lys Leu Asp Gln Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Leu Val Trp Xaa Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Thr Glu Gly Cys Lys Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Lys Asn Ile Asp Val Ala Asp
85 90 95

Thr Lys Glu Xaa Leu Glu Lys Xaa Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Xaa Asn Asn Ser Gln Val
115 120 125

Ser His Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Xaa Val Glu
145 150 155 160

Glu Lys Ala Xaa Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Asp Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Pro Gln Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Xaa Thr Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Xaa Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Xaa Glu Pro Phe Arg Asp Tyr Val Xaa Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ser His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Xaa Gly His
385 390 395 400
Ile Ala Arg Asn Cys Lys Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Xaa Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg
450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Gln Thr Asp
465 470 475 480

Lys Glu Thr Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 4

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 4

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Ala Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Pro Glu Glu Leu Lys Ser Val Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Arg Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Arg Asn Ser
115 120 125
Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln
130 135 140
Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160
Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser
165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190
Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205
Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly
210 215 220
Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240

Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn
245 250 255
Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly
260 265 270
Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Val
275 280 285
Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met
305 310 315 320
Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile
325 330 335
Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350
Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu

355 360 365

Ala Met Ser Gln Ala Asn Ser Thr Thr Ile Met Met Gln Lys Gly Asn
370 375 380
Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400
Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp
405 410 415
Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln
420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Glu Gly Arg Pro Gly
435 440 445
Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser
450 455 460
Phe Arg Phe Gly Glu Gly Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro
465 470 475 480
Ile Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly
485 490 495

Asn Asp Pro Ser Ser Gln
500

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<400> 5

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Lys Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Arg Ile Leu Gly Gln Xaa
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Gly Ile Asp Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys
100 105 110

Lys Xaa Ala Gln Gln Ala Ala Ala Asp Thr Gly Xaa Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Xaa Val Ile Pro Met Phe Ser Ala Xaa Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Xaa Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Ile Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Xaa Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Cys

355 360 365

Gln Ala Asn Ser Asn Thr Ile Met Met Gln Arg Gly Asn Phe Lys Ser

370 375 380

Gln Arg Lys Xaa Val Lys Xaa Phe Asn Cys Gly Arg Glu Gly His Ile

385 390 395 400

Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415

Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Val Asn Phe

420 425 430

Leu Gly Lys Xaa Trp Pro Ser Asn Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg Phe

450 455 460

Gly Glu Glu Thr Thr Ala Pro Pro Gln Lys Gln Glu Pro Ile Asp Lys

465 470 475 480

Asp Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Ser Asp Pro

485 490 495

Ser Ser Gln

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<213> Human immunodeficiency virus

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<220><221> misc_feature

<222> (238)..(238)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (324)..(324)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (335)..(335)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (340)..(340)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (395)..(395)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (424)..(424)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (489)..(489)

<223> Xaa can be any naturally occurring amino acid

<400> 6

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Gln Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Xaa Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
His Pro Xaa Leu His Thr Gly Ser Glu Glu Leu Lys Ser Val Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ile Lys
100 105 110

Lys Lys Val Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His
130 135 140
Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Xaa Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val Pro Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Xaa Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Met Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Xaa Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Xaa Ala
325 330 335
Leu Gly Pro Xaa Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Ala Thr Asn Ala Gly Ala Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ser Ile Lys Cys Phe Asn Xaa Gly Lys Glu Gly His
385 390 395 400
Leu Ala Arg Asn Cys Lys Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Xaa Asp Cys Asn Glu Arg Gln Val Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Thr Ile Asp
465 470 475 480
Arg Asp Lys Glu Leu Tyr Pro Leu Xaa Ser Leu Arg Ser Leu Phe Gly
485 490 495

Asn Asp Pro Ser Ser Gln
500

<210> 7
<211> 500
<212> PRT
<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (61)..(61)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (191)..(191)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (197)..(197)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (216)..(216)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (223)..(223)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (246)..(246)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (295)..(295)

<223> Xaa can be any naturally occurring amino acid

<400> 7

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Xaa Glu Gln Ile
50 55 60

Gln Pro Ser Leu Lys Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Pro Ala Ala Ala Asp Thr Gly Asn Asn Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His

130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Arg Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Ser Asp Leu Asn Ile Met Leu Asn Thr Xaa Gly

180 185 190

Gly His Gln Ala Xaa Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu Xaa Pro Val His Ala Gly Pro Xaa Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Xaa Ile Gly Trp Met Thr Gly Asn Pro Ala Ile

245 250 255

Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Xaa Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Thr Ala Ser Thr Asn Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Gly

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Ser Asp

485 490 495

Pro Ala Ser Gln

500

<210> 8

<211> 507

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (118)..(118)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (127)..(127)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
<222> (140)..(140)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (149)..(149)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (195)..(195)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (298)..(298)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (372)..(372)
<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
<222> (465)..(465)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (472)..(472)
<223> Xaa can be any naturally occurring amino acid
<400> 8

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Xaa Ala Ala Asp Thr Gly Ser Ser Ser Xaa Val

115 120 125

Ser Pro Val Ser Gln Asn Tyr Pro Ile Val Gln Xaa Met Gln Gly Gln

130 135 140

Met Val His Gln Xaa Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys

145 150 155 160

Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser

165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn

180 185 190

Thr Val Xaa Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile

195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly

210 215 220

Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala

225 230 235 240

Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn

245 250 255

Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly

260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile

275 280 285

Arg Gln Gly Pro Lys Glu Pro Phe Arg Xaa Tyr Val Asp Arg Phe Tyr

290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met

305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile
325 330 335
Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350
Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu

355 360 365
Ala Met Ser Xaa Val Thr Asn Ser Ala Asn Ile Met Met Gln Arg Gly
370 375 380
Asn Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys
385 390 395 400
Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys
405 410 415
Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg

420 425 430
Gln Val Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro
435 440 445
Gly Asn Phe Phe Gln Ser Arg Leu Glu Ser Arg Pro Glu Pro Thr Ala
450 455 460
Xaa Pro Glu Glu Ser Phe Arg Xaa Gly Glu Glu Thr Thr Thr Pro Pro
465 470 475 480
Gln Lys Gln Glu Pro Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu

485 490 495
Arg Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 9
<211> 502
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (485)..(485)
<223> Xaa can be any naturally occurring amino acid
<400> 9

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30
His Val Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Met Glu Gln Ile
50 55 60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His His Lys Ile Asp Val Lys Asp

85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser Gly
115 120 125
Lys Val Ser Gln Asn Phe Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140
Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160
Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala
165 170 175
Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
180 185 190
Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205
Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro

210 215 220
Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240
Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro

245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Ala Thr Asn Ala Thr Thr Ile Met Met Gln Arg Gly Asn

370 375 380

Phe Arg Asn Gln Arg Arg Thr Val Lys Cys Phe Asn Cys Gly Lys Glu

385 390 395 400

Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Val Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser

450 455 460

Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro

465 470 475 480

Thr Asp Lys Asp Xaa Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln

500

<210> 10

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (163)..(163)

<223> Xaa can be any naturally occurring amino acid

<400> 10

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ala Leu Arg Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Gln Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Arg Ile Glu Ala Glu Gln Asn Glu Ser Lys

100 105 110

Lys Lys Thr Gln Gln Ala Ala Ala Asp Pro Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Xaa Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Thr His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Asn Lys Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Val Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Leu Glu Pro Ser Arg Pro Glu Pro Thr Ala Pro Pro

450 455 460

Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Pro Thr Pro Pro Gln Lys

465 470 475 480

Gln Glu Pro Ile Asp Lys Glu Leu Tyr Pro Ser Ala Ser Leu Arg Ser

485 490 495

Leu Phe Gly Asn Asp Pro

500

<210> 11

<211> 507

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (8)..(8)

<223> Xaa can be any naturally occurring amino acid

<400> 11

Met Gly Ala Arg Ala Ser Val Xaa Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Ala Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ser Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Ala Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Asp Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Asn Val Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Pro Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Arg Val Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Leu Glu Pro Thr Ala Pro Pro Glu Pro Thr Ala Pro

450 455 460
Pro Glu Glu Ser Phe Arg Phe Gly Gly Glu Thr Thr Thr Pro Ser Gln
465 470 475 480
Arg Gln Glu Pro Ile Asp Lys Glu Leu Tyr Pro Pro Leu Ala Ser Leu
485 490 495
Lys Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 12
<211> 502
<212> PRT
<213> Human immunodeficiency virus
<400> 12

Met Gly Ala Arg Ala Ser Ile Leu Thr Gly Gly Gln Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ala Gly Gly Cys Arg Gln Ile Leu Lys Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Gln Ile Glu Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Gln Thr Gln Gln Ala Ala Ala Ala Ala Gly Thr Gly Asn Ser Ser
115 120 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140
Val His Gln Ala Ile Ala Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160
Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala
165 170 175
Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205
Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro
210 215 220
Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240
Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro
245 250 255

Pro Ile Pro Val Gly Asp Ile Tyr Lys Lys Trp Ile Ile Ile Gly Leu
260 265 270
Asn Lys Ile Val Arg Met Tyr Ser Pro Ala Ser Ile Leu Asp Ile Lys
275 280 285
Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr
305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335
Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350
Gln Gly Val Gly Gly Pro Gly His Lys Ala Ser Val Leu Ala Glu Ala
355 360 365
Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Ile Gln Lys Gly Asn
370 375 380

Phe Arg Asn Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400
Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp
405 410 415
Lys Cys Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln
420 425 430
Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly
435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Ala Glu Ser
450 455 460
Phe Arg Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Glu Gln
465 470 475 480
Thr Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly
485 490 495
Asn Asp Pro Ser Ser Gln
500

<210> 13
<211> 499
<212> PRT
<213> Human immunodeficiency virus

<400> 13

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

His Pro Ser Leu Pro Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Val Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Asn Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Leu Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro Pro Val

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Asn Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Asn Ser Thr Thr Ile Met Met Gln Arg Gly Asn Phe Arg Asn
370 375 380

Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His Leu
385 390 395 400
Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly
405 410 415
Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe
420 425 430
Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe Leu
435 440 445

Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Gly Phe
450 455 460
Gly Glu Glu Ile Val Thr Pro Ser Gln Lys Gln Glu Pro Lys Asp Lys
465 470 475 480
Asp Leu Ser Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro
485 490 495

Ser Ser Gln

<210> 14

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 14

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asn Thr Gly Asn Asn Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Ser Ser Asn Thr Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380

Asn Gln Arg Lys Ser Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Lys Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Arg Asp
465 470 475 480
Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln
500

<210> 15
<211> 498
<212> PRT
<213> Human immunodeficiency virus
<400
> 15

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Ser Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Ile Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ser Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ser Gln Gly Gln Met Ile His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro His Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Leu Arg

370 375 380

Asn Gln Arg Lys Ser Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Asn Arg Thr Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Thr Asp Lys Glu
465 470 475 480
Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser
485 490 495
Ser Gln

<210> 16
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<400> 16
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15
Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30
His Val Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Thr Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80
Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Pro Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Gln Lys Glu Gln Ile Asp
465 470 475 480
Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln
500

<210> 17
<211> 503
<212> PRT
<213> Human immunodeficiency virus
<400> 17
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Arg Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Ile Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Ser Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ala

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Ile His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Ala Thr Asn Ser Thr Ala Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Thr Gln Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Thr Ala Pro Pro Glu Glu

450 455 460
Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu
465 470 475 480
Thr Ile Asp Lys Glu Lys Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe
485 490 495
Gly Asn Asp Pro Leu Ser Gln
500

<210> 18
<211> 502
<212> PRT
<213> Human immunodeficiency virus

<400> 18

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Lys Ile Ile Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Pro Ala Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser

115 120 125

Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln

130 135 140

Met Val His Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys

145 150 155 160

Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser

165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Ile Asn Thr Met Leu Asn

180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile

195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly

210 215 220

Pro Ala Ala Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala

225 230 235 240

```
Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn
                245                 250                 255
Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Ile Gly

            260                 265                 270
Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile
        275                 280                 285
Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
    290                 295                 300
Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met
305                 310                 315                 320
Thr Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile

                325                 330                 335
Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala
            340                 345                 350
Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu
        355                 360                 365
Ala Met Ser Gln Ala Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn
    370                 375                 380
Phe Arg Ser Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu

385                 390                 395                 400
Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp
                405                 410                 415
Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln
            420                 425                 430
Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly
        435                 440                 445
Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser

    450                 455                 460
Phe Ser Phe Gly Glu Gly Thr Thr Ala Pro Ser Gln Lys Gln Glu Pro
465                 470                 475                 480
Thr Asp Lys Glu Met Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly
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485 490 495

Asn Asp Pro Ser Ser Gln

500

<210> 19

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 19

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Leu Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Arg Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Arg Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Asn Ser Gln Asn

115 120 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Phe Gln Gly Gln Met

130 135 140

Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala

165 170 175

Leu Ala Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn

195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro

210 215 220

Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Asp Trp Met Thr His Asn Pro

245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Val Asn Ser Gly Ala Ile Met Met Gln Arg Gly Asn Phe

370 375 380

Arg Asn Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Lys Gln Val

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro Glu

450 455 460

Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln

465 470 475 480

Glu Pro Ile Asp Lys Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly

485 490 495

Asn Asp Pro Leu Ser Gln

500

<210> 20

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (112)..(112)

<223

> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (118)..(118)

<223> Xaa can be any naturally occurring amino acid

<400> 20

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Lys Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Ser Ser Asn Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Lys Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Xaa
100 105 110

Lys Lys Ala Gln Gln Xaa Ala Ala Ala Ala Ala Asp Thr Gly Ser Ser
115 120 125

Asn Gln Thr Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln
130 135 140

Met Val His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160

Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr
165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly
210 215 220

Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240

Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Gly Asn
245 250 255

Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Val Met Gly
260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile
275 280 285

Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met
305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile
325 330 335

Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Ser Ala

340 345 350

Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu

355 360 365

Ala Met Ser Gln Val Thr Asn Ser Ala Thr Val Met Met Gln Arg Gly

370 375 380

Asn Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys

385 390 395 400

Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys

405 410 415

Trp Lys Cys Gly Gln Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg

420 425 430

Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro

435 440 445

Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu

450 455 460

Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu

465 470 475 480

Pro Arg Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe

485 490 495

Gly Asn Asp Pro Ser Ser Gln

500

<210> 21

<211> 504

<212> PRT

<213> Human immunodeficiency virus

<400> 21

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Gln Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Ile Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Ile
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Met Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Gln Lys Ala Gln Arg Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Asn
115 120 125
Ser Asn Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly
130 135 140
Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val
145 150 155 160
Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe
165 170 175

Thr Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu
180 185 190
Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr
195 200 205
Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala
210 215 220
Gly Pro Val Ala Pro Gly Gln Met Arg Asp Pro Arg Gly Ser Asp Ile
225 230 235 240

Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser
245 250 255
Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu
260 265 270
Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp
275 280 285

Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe
290 295 300

Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp
305 310 315 320
Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr
325 330 335
Leu Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr
340 345 350
Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala
355 360 365

Glu Ala Met Ser Gln Met Thr Asn Ser Ala Thr Val Met Met Gln Arg
370 375 380
Gly Asn Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly
385 390 395 400
Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly
405 410 415
Cys Trp Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu
420 425 430

Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg
435 440 445
Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala
450 455 460
Glu Ser Phe Gly Phe Gly Glu Gly Thr Thr Ala Pro Ser Gln Lys Gln
465 470 475 480
Asp Pro Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu
485 490 495

Phe Gly Asn Asp Pro Ser Ser Gln
500

<210> 22
<211> 500
<212> PRT

<213> Human immunodeficiency virus

<400> 22

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Gln Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr His Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Thr Gln Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Glu Asn Asn Lys Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Met Ser Thr Ser Pro Ala Ile Met Met Gln Arg Gly Asn Phe Lys
370 375 380
Asn Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ala His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Thr Asp
465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 23

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 23

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Val Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Gly Val Gln Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Val Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His
130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile
245 250 255
Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Ser Thr Ala Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ser Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480
Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 24
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<400> 24

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Val Ala Asp Thr Gly Asn Ser Ser Gln Val

```
        115                 120                 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
    130                 135                 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145                 150                 155                 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
                165                 170                 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
            180                 185                 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
        195                 200                 205
Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Val Ala
    210                 215                 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225                 230                 235                 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile
                245                 250                 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
            260                 265                 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
        275                 280                 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
    290                 295                 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305                 310                 315                 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Arg Thr Ile Leu Lys Ala
                325                 330                 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
            340                 345                 350
Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
        355                 360                 365
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Gln Ala Thr Asn Ser Ser Thr Val Leu Met Gln Lys Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ile Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Asn Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480
Lys Glu Leu Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495

Pro Leu Ser Gln
500

<210> 25
<211> 503
<212> PRT
<213> Human immunodeficiency virus
<400> 25
Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Gly Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30
His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Asn Pro Val

115 120 125

Ser Gln Asn Phe Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Pro Gln Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Ala Val

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Arg Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Arg Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Lys Ile Leu Ala Glu Ala Met Ser
355 360 365

Gln Ala Thr Ala Ser Ala Ala Ile Met Met Gln Arg Gly Asn Tyr Arg
370 375 380
Asn Gln Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Arg Glu Gly His Gln Met Lys Asp Cys Asn Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro Glu Glu
450 455 460
Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu
465 470 475 480
Thr Ile Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe
485 490 495

Gly Asn Asp Pro Ser Ser Gln
500

<210> 26
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<400> 26
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

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            20                  25                  30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
        35                  40                  45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Gly Gln Leu
    50                  55                  60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65                  70                  75                  80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
                85                  90                  95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
            100                 105                 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Ala Glu Lys Ser Gln Ala Ser
        115                 120                 125
Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln
    130                 135                 140
Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu
145                 150                 155                 160
Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu
                165                 170                 175

Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly
            180                 185                 190
His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala
        195                 200                 205
Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala Pro
    210                 215                 220
Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser
225                 230                 235                 240

Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro
                245                 250                 255
Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile
            260                 265                 270
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Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly Pro
275 280 285
Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Val Leu Arg
290 295 300

Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu
305 310 315 320
Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu
325 330 335
Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val
340 345 350
Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln
355 360 365

Val Thr Asn Ser Ala Thr Val Met Met Gln Arg Gly Asn Pro Arg Asn
370 375 380
Gln Arg Arg Pro Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile
385 390 395 400
Ala Lys Asn Cys Arg Ala Pro Arg Arg Arg Gly Cys Trp Lys Cys Gly
405 410 415
Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe
420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu
435 440 445
Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Pro Pro Glu Ser Phe Gly
450 455 460
Phe Gly Glu Glu Thr Ala Ala Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480
Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 27

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 27

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Val Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Ala Val Ala Val Leu Tyr Cys Val His Gln Gly Met Glu Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Glu Ala Gly Thr Gly Asn Ser Ser Gln Ile
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Asn Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Ser Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Ala Thr Gly Pro Ala Ala Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380

Pro Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Leu Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Val Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Ser Arg Leu Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Arg Asp

465 470 475 480

Gln Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 28

<211> 498

<212> PRT

<213> Human immunodeficiency virus

<400> 28

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Met Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Asn Val Glu Ile Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Arg Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Thr Asn Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Arg Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Ser Ser Gln Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Arg Phe Arg
450 455 460
Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp Lys Glu
465 470 475 480
Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser
485 490 495

Leu Gln

<210> 29
<211> 498
<212> PRT
<213> Human immunodeficiency virus
<400> 29
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15
Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Ile Gly Gln Leu

50 55 60
Gln Pro Ser Leu Lys Thr Gly Ser Glu Glu Ile Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Ser Lys

115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val

130 135 140

His Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val

145 150 155 160

Glu Glu Lys Asn Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu

165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Ile

180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu

195 200 205

Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile

210 215 220

Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr

225 230 235 240

Thr Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro

245 250 255

Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln

275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys

325 330 335

Ala Leu Gly Pro Gly Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Ser Gln Val Thr Thr Pro Pro Ala Ile Met Met Gln Lys Gly Asn Phe

370 375 380

Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Ala Glu Ser Phe

450 455 460

Gly Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Ser Arg

465 470 475 480

Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn

485 490 495

Asp Pro

<210> 30

<211> 500

<212

> PRT

<213> Human immunodeficiency virus

<400> 30

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Gly Gly Cys Lys Gln Ile Met Glu Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Arg Asn Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ser Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Ile Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Thr Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Ile Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Arg Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Arg Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Ser Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Pro Ser Gln Lys Lys Glu Gln Ile Asp Lys

465 470 475 480

Glu Leu Tyr Pro Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 31

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 31

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Gln Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Phe Arg
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Ser Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp
85 90 95
Thr Lys Asp Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125
Ser Gln Asn Tyr Pro Val Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gly Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Asp Asn Phe Lys

370 375 380

Asn Gln Arg Arg Ile Val Lys Cys Phe Asn Cys Gly Lys Val Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Arg Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Ala Ala Ala Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Met Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 32

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 32

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Ala Glu Lys Ser Gln Ala Ser

115 120 125

Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln
130 135 140

Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu
145 150 155 160

Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu
165 170 175

Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly

180 185 190

His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala

195 200 205

Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala Pro

210 215 220

Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser

225 230 235 240

Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro

245 250 255

Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile

260 265 270

Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly Pro

275 280 285

Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Val Leu Arg

290 295 300

Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu

305 310 315 320

Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu

325 330 335

Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val

340 345 350

Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln

355 360 365

Val Thr Asn Ser Ala Thr Val Met Met Gln Arg Gly Asn Pro Arg Asn

370 375 380

Gln Arg Arg Pro Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile

385 390 395 400

Ala Lys Asn Cys Arg Ala Pro Arg Arg Arg Gly Cys Trp Lys Cys Gly

405 410 415

Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Pro Pro Glu Ser Phe Gly

450 455 460

Phe Gly Glu Glu Thr Ala Ala Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 33

<211> 509

<212> PRT

<213> Human immunodeficiency virus

<400> 33

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Ile Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Val Leu Phe Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Thr Gly Asn Ser Asn Pro Gly

115 120 125

Ser Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly

130 135 140

Gln Met Val His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val

145 150 155 160

Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe

165 170 175

Ser Ala Leu Ala Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu

180 185 190

Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr

195 200 205

Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala

210 215 220

Gly Pro Ile Ala Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile

225 230 235 240

Ala Gly Thr Thr Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr His

245 250 255

Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu

260 265 270

Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp

275 280 285

Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe

290 295 300

Tyr Arg Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp

305 310 315 320

Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr

325 330 335

Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr

340 345 350

Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala

355 360 365

Glu Ala Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg

370 375 380

Gly Asn Phe Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly

385 390 395 400

Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly
405 410 415
Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Ser Glu
420 425 430
Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg

435 440 445
Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala
450 455 460
Glu Ser Phe Leu Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln
465 470 475 480
Glu Pro Ile Lys Gln Glu Pro Ile Asp Lys Glu Leu Tyr Pro Leu Ala
485 490 495
Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505

<210> 34
<211> 509
<212> PRT
<213> Human immunodeficiency virus
<400> 34
Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Arg Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Arg Ser Lys

100 105 110

Lys Gln Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Ser Gln
115 120 125
Ala His Ser Ser Gln Val Ser Gln Val Ser Gln Asn Tyr Pro Ile Val
130 135 140
Gln Asn Met Gln Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr
145 150 155 160
Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu
165 170 175

Val Ile Pro Met Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp
180 185 190
Leu Asn Thr Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln
195 200 205
Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu
210 215 220
His Pro Val His Ala Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro
225 230 235 240

Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile
245 250 255
Gly Trp Met Thr Asn Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys
260 265 270
Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro
275 280 285
Thr Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp
290 295 300

Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln
305 310 315 320
Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn
325 330 335
Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu
340 345 350

Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys
355 360 365

Ala Arg Val Leu Ala Glu Ala Met Ser Gln Val Thr Asn Ser Ala Thr
370 375 380
Ile Met Met Gln Lys Gly Asn Phe Arg Asn Pro Arg Lys Thr Val Lys
385 390 395 400
Cys Phe Asn Cys Gly Lys Asp Gly His Ile Ala Arg Asn Cys Arg Ala
405 410 415
Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met
420 425 430

Lys Asp Cys Asn Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro
435 440 445
Ser His Lys Gly Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro
450 455 460
Ser Ala Pro Pro Ala Glu Ser Phe Lys Phe Gly Glu Glu Thr Thr Thr
465 470 475 480
Pro Ser Gln Lys Gln Glu Pro Ile Asp Lys Glu Met Tyr Pro Leu Ala
485 490 495

Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Leu Ser Gln
500 505

<210> 35
<211> 501
<212> PRT
<213> Human immunodeficiency virus
<400> 35
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Ala Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Ile Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Val Ala Leu Ser

165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Ala His Pro Val His Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Gln Asn Pro Pro Ile
245 250 255
Gln Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ile Ala Thr Pro Pro Ala Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Gly Gln Arg Lys Val Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Pro Arg

465 470 475 480

Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn

485 490 495

Asp Pro Ser Ser Gln

500

<210> 36

<211> 521

<212> PRT

<213> Human immunodeficiency virus

<400> 36

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110
Lys Arg Ala Gln Gln Ala Ala Ala Gln Gln Ala Ala Ala Ala Ala Asp
115 120 125
Thr Gly Asn Arg Asn Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn
130 135 140
Leu Gln Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn
145 150 155 160
Ala Trp Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile

165 170 175
Pro Met Phe Thr Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn
180 185 190
Thr Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu
195 200 205
Lys Glu Thr Ile Asn Glu Glu Ala Ala Asp Trp Asp Arg Thr Gln Pro
210 215 220
Val His Ala Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly

225 230 235 240
Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Val Ala Trp

245 250 255

Met Thr Ser Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp

260 265 270

Ile Ile Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser

275 280 285

Ile Leu Asp Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val

290 295 300

Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Thr Gln Glu Val

305 310 315 320

Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp

325 330 335

Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu

340 345 350

Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg

355 360 365

Val Leu Ala Glu Ala Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met

370 375 380

Met Gln Arg Gly Asn Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe

385 390 395 400

Asn Cys Gly Lys Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg

405 410 415

Lys Lys Gly Cys Trp Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp

420 425 430

Cys Thr Glu Arg Gln Ala Asn Phe Leu Gly Arg Ile Trp Pro Ser His

435 440 445

Lys Gly Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala

450 455 460

Pro Leu Glu Glu Ser Phe Arg Ser Arg Pro Glu Pro Thr Ala Pro Pro

465 470 475 480

Ala Glu Ser Phe Arg Phe Gly Glu Glu Ala Ala Ala Pro Ser Gln Lys

485 490 495

Arg Glu Pro Thr Asp Gln Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser

500 505 510

Leu Phe Gly Asn Asp Pro Ser Ser Gln

515 520

<210> 37

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<400> 37

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Lys Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Arg Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Asp Thr Gly Asn Ser Asn Gln

115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val

130 135 140

His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val

145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu

165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val

180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu

195 200 205

Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile

210 215 220

Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr

225 230 235 240

Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro

245 250 255

Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln

275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys

325 330 335

Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe

370 375 380

Arg Ser Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Arg Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn
435 440 445
Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe
450 455 460
Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Asn Pro Glu Met Arg

465 470 475 480
Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn
485 490 495
Asp Pro Ser Ser Gln
500

<210> 38
<211> 499
<212> PRT
<213> Human immunodeficiency virus
<400> 38
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30
His Val Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Lys Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Gln Lys Thr Gln Gln Ala Ala Ala Gly Gly Asn Ser Ser Gln Val Ser
115 120 125
Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His Gln

130 135 140

Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu

145 150 155 160

Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu

165 170 175

Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly

180 185 190

His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala

195 200 205

Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala Pro

210 215 220

Gly Gln Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser

225 230 235 240

Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile Pro

245 250 255

Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile

260 265 270

Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly Pro

275 280 285

Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg

290 295 300

Ala Glu Gln Ala Ser Gln Glu Val Lys His Trp Met Thr Glu Thr Leu

305 310 315 320

Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu

325 330 335

Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val

340 345 350

Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln

355 360 365

Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Lys Asn

370 375 380

Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile
385 390 395 400
Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415
Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Val Asn Phe
420 425 430
Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu
435 440 445
Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe
450 455 460
Gly Glu Glu Thr Thr Thr Pro Ala Gln Lys Gln Glu Pro Ile Asp Lys

465 470 475 480
Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro
485 490 495
Ser Ser Gln

<210> 39
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (383)..(383)
<223> Xaa can be any naturally occurring amino acid
<400> 39
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Ile Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Met Glu Gln Ile
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Gly Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Gly Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Ala Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Xaa Arg

370 375 380

Ser Gln Lys Arg Met Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Met Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Met Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 40

<211> 509

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (50)..(50)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (82)..(82)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (104)..(104)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (135)..(135)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (183)..(183)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (261)..(261)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (288)..(288)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (301)..(301)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (335)..(335)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (340)..(340)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (379)..(379)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (398)..(398)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (492)..(492)

<223> Xaa can be any naturally occurring amino acid

<400> 40

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Gln Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Lys Tyr Lys Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Xaa Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ser Leu Lys Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Xaa Ala Thr Leu Tyr Cys Val Leu Gln Arg Ile Glu Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Xaa Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Thr Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Arg Ser
115 120 125

Pro Val Ser Gln Gly Ser Xaa Gln Val Ser Gln Asn Tyr Pro Ile Val
130 135 140

Gln Asn Leu Gln Gly Gln Met Val His Gln Pro Leu Ser Pro Arg Thr
145 150 155 160

Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys Ala Phe Ser Pro Glu
165 170 175

Val Ile Pro Met Phe Ser Xaa Leu Ser Glu Gly Ala Thr Pro Gln Asp
180 185 190

Leu Asn Thr Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln
195 200 205

Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu

210 215 220

His Pro Val His Ala Gly Pro Ala Ala Pro Gly Gln Met Arg Glu Pro
225 230 235 240

Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile
245 250 255

Gly Trp Met Thr Xaa Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys
260 265 270

Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Xaa
275 280 285

Val Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu Xaa Phe Arg Asp
290 295 300

Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Thr Gln
305 310 315 320

Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn Xaa Asn
325 330 335

Pro Asp Cys Xaa Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu
340 345 350

Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys
355 360 365

Ala Arg Val Leu Ala Glu Ala Met Ser Gln Xaa Thr Gly Ser Ala Thr
370 375 380

Ile Met Met Gln Lys Gly Asn Phe Arg Asn Gln Arg Lys Xaa Val Lys
385 390 395 400

Cys Phe Asn Cys Gly Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala
405 410 415

Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Leu
420 425 430

Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro
435 440 445

Ser His Lys Gly Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro
450 455 460

Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Ala Met

465 470 475 480

Pro Ser Gln Lys Gln Glu Pro Ile Asp Lys Glu Xaa Tyr Pro Leu Ala

485 490 495

Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505

<210> 41

<211> 497

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (114)..(114)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (258)..(258)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (381)..(381)

<223> Xaa can be any naturally occurring amino acid

<400> 41

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Ile Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Ile Glu Gln Leu

50 55 60

Gln Pro Ser Leu Gln Val Gly Ser Glu Glu Ile Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Lys Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Lys Asn Arg Ser Lys
100 105 110
Lys Xaa Ala Gln Gln Ala Ala Ala Asp Ser Ser Gln Val Ser Gln Asn
115 120 125
Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln Ala Leu

130 135 140
Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys Ala
145 150 155 160
Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu Gly Ala
165 170 175
Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His Gln
180 185 190
Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu

195 200 205
Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala Pro Gly Gln
210 215 220
Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu
225 230 235 240
Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro Val Gly
245 250 255
Glu Xaa Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg

260 265 270
Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu
275 280 285
Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu
290 295 300
Gln Cys Thr Gln Asp Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val
305 310 315 320
Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro

325 330 335
Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly

340 345 350

Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Ala Thr

355 360 365

Thr Pro Ala Ala Ile Met Met Gln Arg Gly Asn Phe Xaa Asn Gln Arg

370 375 380

Lys Thr Val Lys Cys Phe Asn Cys Gly Arg Glu Gly His Ile Ala Lys

385 390 395 400

Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Lys Glu

405 410 415

Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe Leu Gly

420 425 430

Lys Ile Trp Pro Ser Asn Lys Gly Arg Pro Gly Asn Phe Leu Gln Ser

435 440 445

Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu

450 455 460

Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Arg Asp Lys Asp Leu

465 470 475 480

Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Ser Ser

485 490 495

Gln

<210> 42

<211> 504

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (75)..(75)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (330)..(330)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (435)..(435)

<223> Xaa can be any naturally occurring amino acid

<400> 42

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Xaa Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Pro Gln Ala Ala Ala Gly Ala Gly Asn
115 120 125

Asn Ser Gln Val Ser Tyr Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly
130 135 140

Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val
145 150 155 160

Lys Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe
165 170 175

Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu
180 185 190

Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr
195 200 205

Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala
210 215 220

Gly Pro Thr Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile

225 230 235 240

Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser

245 250 255

Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu

260 265 270

Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp

275 280 285

Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe

290 295 300

Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp

305 310 315 320

Met Thr Glu Thr Leu Leu Val Gln Asn Xaa Asn Pro Asp Cys Lys Thr

325 330 335

Ile Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr

340 345 350

Ala Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala

355 360 365

Glu Ala Met Ser Gln Ala Gln Ser Ser Ala Asn Met Met Met Gln Arg

370 375 380

Gly Asn Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly

385 390 395 400

Lys Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly

405 410 415

Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu

420 425 430

Arg Gln Xaa Asn Phe Leu Gly Lys Leu Trp Pro Ser His Lys Gly Arg

435 440 445

Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu

450 455 460

Glu Ser Phe Lys Phe Gly Gly Glu Thr Thr Thr Pro Pro Gln Lys Gln

465 470 475 480

Glu Pro Ile Asp Lys Glu Met Tyr Pro Leu Ala Ser Leu Arg Ser Leu

485 490 495

Phe Gly Asn Asp Pro Ser Ser Gln

500

<210> 43

<211> 510

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (90)..(90)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (139)..(139)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (163)..(163)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (169)..(169)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (368)..(368)

<223> Xaa can be any naturally occurring amino acid

<400> 43

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Pro Thr Gly Ser Glu Glu Ile Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Xaa Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Ile Lys Ala Gln Gln Ala Ala Ala Gln Gln Ala Ala Ala Ala Thr Gly

115 120 125

Ser Ser Gln Val Ser Gln Asn Tyr Pro Ile Xaa Gln Asn Leu Gln Gly

130 135 140

Gln Met Val His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val

145 150 155 160

Lys Val Xaa Glu Glu Lys Ala Phe Xaa Pro Glu Val Ile Pro Met Phe

165 170 175

Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu

180 185 190

Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr

195 200 205

Ile Asn Asp Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala

210 215 220

Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile

225 230 235 240

Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn

245 250 255

Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu

260 265 270

Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp

275 280 285

Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe

290 295 300

Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp
305 310 315 320
Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr
325 330 335
Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr
340 345 350
Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Xaa

355 360 365
Glu Ala Met Ser Gln Val Gln Asn Ser Asn Ala Ile Met Met Gln Arg
370 375 380
Gly Asn Phe Lys Thr Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly
385 390 395 400
Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly
405 410 415
Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Thr

420 425 430
Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly
435 440 445
Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro
450 455 460
Glu Glu Ser Phe Arg Phe Gly Glu Glu Ala Ala Ala Pro Ser Gln Lys
465 470 475 480
Gln Glu Pro Met His Lys Glu Lys Gln Glu Pro Arg Asp Lys Glu Leu

485 490 495
Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro
500 505 510

<210> 44
<211> 503
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (119)..(119)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (140)..(140)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (258)..(258)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (261)..(261)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (268)..(268)

<223> Xaa can be any naturally occurring amino acid

<400> 44

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Asn Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Val Glu Glu Glu Gln Asn Lys Cys Lys
100 105 110

Asn Lys Ala Gln Gln Ala Xaa Ala Gly Thr Gly Asn Asn Ser Gln Ala
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Xaa Gln Met Val His
130 135 140

Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Xaa Gly Glu Xaa Tyr Lys Arg Trp Ile Ile Xaa Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Ala Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380
Lys Gln Arg Asn Ser Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Val Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro Glu Glu

450 455 460

Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu

465 470 475 480

Pro Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe

485 490 495

Gly Asn Asp Pro Leu Ser Gln

500

<210> 45

<211> 505

<212> PRT

<213> Human immunodeficiency virus

<400> 45

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Arg Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Pro Ile Ala Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Ala Gln Ala Gly Pro Val Ala
210 215 220

Pro Gly Gln Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Ile Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Ser Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Ser His Lys Ala Lys Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Thr Ala Thr Met Met Met Gln Arg Gly Asn
370 375 380
Phe Arg Asn Gln Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400
Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp
405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln
420 425 430
Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly
435 440 445
Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro
450 455 460
Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Leu Gln Lys
465 470 475 480

Gln Glu Gln Thr Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser
485 490 495
Leu Phe Gly Asn Asp Pro Ser Ser Thr
500 505

<210> 46
<211> 501
<212> PRT
<213> Human immunodeficiency virus
<400> 46
Met Gly Ala Arg Ala Ser Val Leu Arg Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys
20 25 30

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His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
        35                  40                  45
Ser Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Arg Gln Leu
    50                  55                  60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65                  70                  75                  80
Thr Ile Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Ile Lys Asp
                85                  90                  95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Glu Ser Lys
            100                 105                 110
Lys Lys Ala Gln Arg Gln Ala Ala Glu Ala Asp Pro Gly Lys Asn Ser
        115                 120                 125
Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
    130                 135                 140
Val His Asn Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145                 150                 155                 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala
                165                 170                 175
Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
            180                 185                 190
Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
        195                 200                 205
Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro
    210                 215                 220

Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225                 230                 235                 240
Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro
                245                 250                 255
Pro Ile Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu
            260                 265                 270
Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg
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275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
290 295 300
Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr
305 310 315 320
Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335
Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365
Met Asn Gln Ala Asn Ser Ala Ala Ile Met Met Gln Arg Gly Asn Phe
370 375 380
Lys Asn Gln Arg Arg Thr Ile Lys Cys Phe Asn Cys Gly Arg Glu Gly
385 390 395 400
His Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys
405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala
420 425 430
Asn Phe Leu Gly Lys Ile Trp Pro Ser Leu Lys Gly Arg Pro Gly Asn
435 440 445
Phe Leu Gln Asn Arg Pro Glu Pro Ser Ala Pro Pro Ala Glu Ser Phe
450 455 460
Gly Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile
465 470 475 480

Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Ser
485 490 495
Asp Pro Ser Ser Gln
500

<210> 47

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 47

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Lys Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Ser Ile Asp Val Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Val Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Val
245 250 255
Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Met Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Gly
355 360 365
Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Asp Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro Glu Glu
450 455 460
Ser Phe Arg Phe Gly Glu Glu Ala Ala Ala Pro Pro Gln Lys Gln Glu

465 470 475 480

Pro Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe
485 490 495

Gly Asn Asp Pro
500

<210> 48

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 48

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Thr Tyr Lys Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Gln Val Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser Ser
115 120 125

Asn Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met
130 135 140

Val His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160

Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala

165 170 175

Leu Ser Glu Gly Ala Thr Pro Gly Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn

195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro

210 215 220

Val Ala Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro

245 250 255

Pro Ile Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Ala Cys Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn

370 375 380

Phe Arg Asp Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu

385 390 395 400

Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp

405 410 415

Lys Cys Gly Gln Glu Gly His Gln Met Lys Asp Cys Thr Gly Arg Gln
420 425 430
Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly
435 440 445
Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser
450 455 460
Phe Thr Phe Gly Glu Glu Ala Ala Thr Pro Ser Gln Lys Gln Glu Thr
465 470 475 480

Arg Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly
485 490 495
Asn Asp Pro Ser Ser Gln
500

<210> 49
<211> 504
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (129)..(129)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (228)..(228)
<223> Xaa can be any naturally occurring amino acid
<400> 49
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Val Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Ser Ser Ser

115 120 125

Xaa Gln Val Ser Gln Asn Phe Pro Ile Val Gln Asn Leu Gln Gly Gln

130 135 140

Met Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys

145 150 155 160

Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser

165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn

180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile

195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly

210 215 220

Pro Ile Ala Xaa Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala

225 230 235 240

Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn

245 250 255

Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly

260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile

275 280 285

Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr

290 295 300

Arg Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met

305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile

325 330 335

Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala

340 345 350

Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu

355 360 365

Ala Met Ser Gln Val Thr Asn Pro Thr Asn Ile Met Met Gln Arg Gly

370 375 380

Asn Phe Arg Asn Gln Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Lys

385 390 395 400

Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys

405 410 415

Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg

420 425 430

Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Gln Lys Gly Arg Pro

435 440 445

Gly Asn Phe Pro Gln Gly Arg Leu Glu Pro Thr Ala Pro Pro Glu Glu

450 455 460

Ser Phe Arg Ser Gly Glu Glu Thr Ala Thr Pro Ser Gln Arg Gln Glu

465 470 475 480

Thr Val Asp Lys Glu Leu Tyr Pro Pro Leu Thr Ser Leu Arg Ser Leu

485 490 495

Phe Gly Ser Asp Pro Ser Ser Gln

500

<210> 50

<211> 508

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (84)..(84)

<223> Xaa can be any naturally occurring amino acid

<400> 50

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Ser Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Met Glu Gln Leu

50 55 60

Gln Pro Ala Leu Arg Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Xaa Leu Tyr Cys Val His Gln Arg Ile Gln Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Asn Ser Gln Gly

115 120 125

Asn Asn Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln
130 135 140

Gly Gln Met Val His Gln Ala Met Ser Pro Arg Thr Leu Asn Ala Trp
145 150 155 160

Val Lys Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met
165 170 175

Phe Ala Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met

180 185 190

Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu
195 200 205

Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Met His Pro Val His
210 215 220

Ala Gly Pro Leu Pro Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp
225 230 235 240

Ile Ala Gly Thr Thr Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr

245 250 255

Ser Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile

260 265 270

Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Ser Ser Ile Leu

275 280 285

Asp Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg

290 295 300

Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn

305 310 315 320

Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys

325 330 335

Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met

340 345 350

Thr Ala Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu

355 360 365

Ala Glu Ala Met Ser Gln Val Asn Asn Ser Ala Ala Ile Met Met Gln

370 375 380

Lys Gly Asn Phe Arg Asn Gln Lys Lys Ile Pro Lys Cys Phe Asn Cys

385 390 395 400

Gly Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg

405 410 415

Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr

420 425 430

Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly

435 440 445

Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro

450 455 460

Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro

465 470 475 480

Ser Gln Lys Gln Glu Ser Gly Asn Lys Glu Leu Tyr Pro Leu Ala Ser

485 490 495

Leu Arg Ser Leu Phe Gly Ser Asp Pro Ser Ser Gln

500 505

<210> 51

<211> 506

<212> PRT

<213> Human immunodeficiency virus

<400> 51

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Ala Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Asn Lys Arg Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Ile Gly Gln Leu
50 55 60

Gln Pro Ser Leu Lys Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys
100 105 110

Glu Lys Ala Gln Gln Ala Ala Ala Asn Thr Gly Asn Ser Gly Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Asn Pro

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Thr Asn Thr Ala Ala Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Val Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Leu Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Gln Gln Lys Gln Ala Pro Pro Gln
465 470 475 480
Lys Gln Glu Pro Thr Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg
485 490 495

Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 52
<211> 506
<212> PRT
<213> Human immunodeficiency virus
<400> 52
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Ile Ser Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Gln Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Phe Arg Ser Leu Tyr Asn
65 70 75 80
Thr Ile Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Gln Ile Glu Glu Glu Gln Thr Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Gln Gln Ala Ala Ala Ala Ala
115 120 125
Glu Thr Ser Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met

130 135 140

Gln Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala
145 150 155 160

Trp Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro
165 170 175

Met Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr
180 185 190

Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys
195 200 205

Asp Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val
210 215 220

His Ala Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Lys Gly Ser
225 230 235 240

Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met
245 250 255

Thr His Ile Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile
260 265 270

Ile Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile
275 280 285

Leu Asp Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp
290 295 300

Arg Phe Tyr Arg Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys
305 310 315 320

Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys
325 330 335

Lys Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met
340 345 350

Met Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val
355 360 365

Leu Ala Glu Ala Met Ser Gln Val Thr Gly Ser Ala Thr Ile Met Met
370 375 380

Gln Lys Gly Asn Phe Arg Asn Gln Arg Lys Met Val Lys Cys Phe Asn
385 390 395 400
Cys Gly Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys
405 410 415
Arg Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys
420 425 430

Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys
435 440 445
Gly Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro
450 455 460
Pro Glu Glu Ser Phe Arg Ser Gly Glu Glu Thr Thr Ala Pro Ser Gln
465 470 475 480
Lys Gln Glu Pro Lys Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg
485 490 495

Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 53
<211> 508
<212> PRT
<213> Human immunodeficiency virus
<400> 53
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Pro Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Ile Ala Val Leu Tyr Cys Val His Gln Asn Ile Glu Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Arg Asn Ser Gly Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu

130 135 140

Gln Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala

145 150 155 160

Trp Val Lys Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro

165 170 175

Met Phe Thr Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr

180 185 190

Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys

195 200 205

Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Met His Pro Val

210 215 220

His Ala Gly Pro Ala Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser

225 230 235 240

Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met

245 250 255

Thr Gly Asn Pro Pro Val Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile

260 265 270

Ile Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile

275 280 285

Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp

290 295 300

Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys

305 310 315 320

Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys

325 330 335

Lys Thr Ile Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met
340 345 350
Met Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val
355 360 365

Leu Ala Glu Ala Met Ser Gln Val Thr Asn Ser Asn Thr Ile Met Met
370 375 380
Gln Arg Gly Asn Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn
385 390 395 400
Cys Gly Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys
405 410 415
Lys Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys
420 425 430

Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys
435 440 445
Gly Arg Pro Gly Asn Phe Leu Gln Asn Arg Pro Glu Pro Ser Ala Pro
450 455 460
Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Ile Thr Pro Ser Gln
465 470 475 480
Lys Gln Glu Gln Thr Asp Arg Asp Lys Glu Lys Tyr Pro Leu Thr Ser
485 490 495

Leu Arg Ser Leu Phe Gly Asn Asp Pro Leu Ser Gln
500 505

<210> 54
<211> 504
<212> PRT
<213> Human immunodeficiency virus
<400> 54
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Ile Arg Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Met Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Ser Gln

115 120 125

Val Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly

130 135 140

Gln Met Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val

145 150 155 160

Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe

165 170 175

Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu

180 185 190

Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr

195 200 205

Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala

210 215 220

Gly Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile

225 230 235 240

Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His

245 250 255

Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu

260 265 270

Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Ala Ser Ile Leu Asp

275 280 285

Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe

290 295 300

Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp

305 310 315 320

Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr

325 330 335

Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr

340 345 350

Ala Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala

355 360 365

Glu Ala Met Ser Gln Val Thr Asn Ser Asn Thr Ile Met Met Gln Arg

370 375 380

Gly Asn Phe Arg Asn Gln Lys Arg Thr Val Lys Cys Phe Asn Cys Gly

385 390 395 400

Lys Asp Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly

405 410 415

Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu

420 425 430

Arg Gln Ala Asn Phe Leu Gly Lys Val Trp Pro Ser His Lys Gly Arg

435 440 445

Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu

450 455 460

Lys Ser Phe Arg Phe Gly Glu Glu Thr Ala Ala Pro Pro Gln Lys Gln

465 470 475 480

Glu Pro Ile Asp Lys Gly Leu Tyr Pro Ser Ala Ser Leu Arg Ser Leu

485 490 495

Phe Gly Asn Asp Pro Ser Ser Gln

500

<210> 55

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 55

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Arg Gln Ile
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Ile Val Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Ser Lys Ser Lys
100 105 110

Lys Lys Glu Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Val

245 250 255

Pro Val Gly Glu Ile Tyr Lys Thr Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Ile Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Asp Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Met Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Ser Gln Gly Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Gln Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Arg Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Gly Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Ser Gly Glu Glu Thr Thr Ser Pro Ser Gln Lys Gln Glu Thr Ile Asp

465 470 475 480

Lys Thr Leu Tyr Pro Ser Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 56

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<400> 56

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Ile Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Lys Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Arg Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Ile Ala Val Leu Phe Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Lys Asn Lys Ser Lys

100 105 110

Lys Arg Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly

130 135 140

Gln Met Val His Gln Pro Ile Thr Pro Arg Thr Leu Asn Ala Trp Val

145 150 155 160

Lys Val Val Glu Glu Lys Ser Phe Ser Pro Glu Val Ile Pro Met Phe

165 170 175

Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu

180 185 190

Asn Thr Ile Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr

195 200 205

Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala

210 215 220

Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile

225 230 235 240

Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Ile Thr His

245 250 255

Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu

260 265 270

Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp

275 280 285

Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe

290 295 300

Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp

305 310 315 320

Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr

325 330 335

Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr

340 345 350

Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala

355 360 365

Glu Ala Met Ser Gln Val Thr Asn Pro Pro Thr Ile Met Met Gln Arg

370 375 380

Gly Asn Phe Arg Asn Gln Gly Arg Ile Val Lys Cys Phe Asn Cys Gly

385 390 395 400

Lys Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly

405 410 415

Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu

420 425 430

Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg

435 440 445

Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu

450 455 460

Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Pro Ser Gln Lys Gln Glu

465 470 475 480

Gln Ile Asp Lys Glu Leu Tyr Pro Ser Ala Ser Leu Lys Ser Leu Phe

485 490 495

Gly Asn Asp Pro Ser Ser Gln

500

<210> 57

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<400> 57

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Lys Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ala Leu Arg Thr Gly Thr Glu Glu Leu Arg Ser Leu Asn Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Arg Gln Ile Glu Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Glu Ala Asp Thr Gly Asn Ser Arg Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Ile Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Asn Ile Leu Lys Ala
325 330 335
Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Gly

355 360 365

Gln Ile Thr Ser Ser Ala Thr Val Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Gly Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Lys Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Gln Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Pro Gln Ser Arg Leu Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Gly Thr Met Asp

465 470 475 480

Lys Glu His Pro Ser Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn

485 490 495

Asp Pro Leu Ser Gln

500

<210> 58

<211> 507

<212> PRT

<213> Human immunodeficiency virus

<400> 58

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Val Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Asp Val Arg Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110
Glu Lys Ala Gln Thr Ala Ala Gln Lys Ala Ala Ala Asp Thr Lys Asn
115 120 125
Ser Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly
130 135 140
Gln Met Val His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val
145 150 155 160
Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe

165 170 175
Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu
180 185 190
Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Ile Leu Lys Glu Thr
195 200 205
Ile Asn Glu Glu Ala Ala Asp Trp Asp Arg Leu His Pro Val Gln Ala
210 215 220
Gly Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile

225 230 235 240
Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser
245 250 255
Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met
260 265 270
Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Gly Ile Leu Asp
275 280 285
Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe

290 295 300
Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp

305 310 315 320

Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr

325 330 335

Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr

340 345 350

Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala

355 360 365

Glu Ala Met Ser Gln Met Thr Asn Ser Ala Thr Ile Met Met Gln Lys

370 375 380

Gly Asn Phe Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly

385 390 395 400

Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly

405 410 415

Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu

420 425 430

Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg

435 440 445

Pro Gly Asn Phe Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Ala

450 455 460

Pro Pro Glu Glu Ser Phe Lys Phe Gly Glu Glu Thr Thr Thr Pro Pro

465 470 475 480

Gln Lys Gln Glu Pro Lys Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu

485 490 495

Arg Ser Leu Phe Gly Asn Asp Pro Leu Ser Gln

500 505

<210> 59

<211> 504

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (113)..(113)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (130)..(130)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (250)..(250)

<223> Xaa can be any naturally occurring amino acid

<400> 59

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Arg Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Thr Leu Cys Cys Val His Gln Gly Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Xaa Lys Thr Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser Gly
115 120 125

Gln Xaa Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140

Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala
165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205
Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro
210 215 220
Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240
Thr Thr Ser Thr Leu Gln Glu Gln Ile Xaa Trp Met Thr Asn Asn Pro
245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu
260 265 270
Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys
275 280 285
Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
290 295 300
Thr Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr
305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335
Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350
Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365
Met Ser Gln Val Thr Asn Ser Thr Ala Ile Met Met Gln Lys Gly Asn
370 375 380

Phe Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400
Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp
405 410 415
Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln
420 425 430
Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser
450 455 460
Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Lys Gln
465 470 475 480
Glu Pro Val Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu
485 490 495
Phe Gly Asn Asp Pro Ser Ser Gln
500

<210> 60
<211> 501
<212> PRT
<213> Human immunodeficiency virus

<400> 60
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15
Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ser Ile Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Arg Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Glu Ala Asp Thr Gly Ser Asn Asn Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Lys Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ala Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Ile Leu Ala Glu Ala Met Cys

355 360 365

Gln Val Thr Asn Ala Asn Thr Ile Met Met Gln Arg Gly Asn Phe Lys

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Gly Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Gly Arg Pro Gly Asn
435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe
450 455 460
Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile
465 470 475 480
Asn Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn
485 490 495
Asp Pro Ser Ser Gln
500

<210> 61
<211> 504
<212> PRT
<213> Human immunodeficiency virus

<400> 61
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Asp Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Ile Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Met Ser Gln Leu
50 55 60

Gln Ser Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Ile Val Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Ser Gln

115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val

130 135 140

His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val

145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu

165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val

180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu

195 200 205

Glu Ala Ala Glu Trp Asp Arg Leu His Pro Ala Gln Ala Gly Pro Val

210 215 220

Gln Pro Gly Gln Ile Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr

225 230 235 240

Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro Pro

245 250 255

Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile Lys Gln

275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys

325 330 335

Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln
340 345 350
Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met
355 360 365
Ser Gln Val Asn Asn Ser Ala Ser Val Met Met Gln Lys Gly Asn Phe
370 375 380

Lys Asn Gln Lys Arg Thr Val Lys Cys Phe Asn Cys Gly Lys Val Gly
385 390 395 400
His Ile Ala Arg Asn Cys Arg Ala Pro Arg Arg Lys Gly Cys Trp Lys
405 410 415
Cys Gly Lys Glu Gly His Gln Met Lys Glu Cys Ser Glu Lys Gln Ala
420 425 430
Asn Phe Leu Gly Lys Val Trp Pro Ser His Lys Gly Arg Pro Gly Asn
435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Ser Glu
450 455 460
Glu Ser Phe Arg Phe Gly Glu Glu Thr Ala Ala Pro Pro Gln Lys Gln
465 470 475 480
Glu Pro Ile Asp Gln Gly Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu
485 490 495
Phe Gly Asn Asp Pro Ser Ser Gln
500

<210> 62
<211> 510
<212> PRT
<213> Human immunodeficiency virus

<400> 62
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

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        35                  40                  45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Lys Ile Leu Gly Gln Leu
    50                  55                  60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65                  70                  75                  80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
                85                  90                  95
Thr Lys Glu Ala Leu Asp Arg Ile Glu Glu Glu Gln Asn Lys Ser Lys
            100                 105                 110
Lys Lys Ala Gln Pro Ala Ala Ala Ala Ala Asp Thr Gly Asn Asn Ser
        115                 120                 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
    130                 135                 140
Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145                 150                 155                 160
Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala
                165                 170                 175
Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
            180                 185                 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
        195                 200                 205
Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro
    210                 215                 220
Ile Ala Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225                 230                 235                 240
Thr Thr Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro
                245                 250                 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu
            260                 265                 270
Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys
        275                 280                 285
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Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
290 295 300
Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr
305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335
Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350
Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365
Met Ser Gln Val Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe
370 375 380

Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly
385 390 395 400
His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys
405 410 415
Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala
420 425 430
Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn
435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe
450 455 460
Arg Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Glu Pro Ala
465 470 475 480
Thr Pro Ser Gln Lys Gln Glu Gln Ile Asp Lys Glu Leu Tyr Pro Leu
485 490 495
Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505 510

<210> 63
<211> 506
<212> PRT

<213> Human immunodeficiency virus

<400> 63

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Ala Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Ser Leu Leu Glu Thr Pro Glu Gly Cys Lys Gln Ile Leu Val Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Ser Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Arg Thr Gln Gln Ala Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln

115 120 125

Gly Ser Gln Val Ser His Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly
130 135 140

Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val
145 150 155 160

Lys Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe
165 170 175

Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu

180 185 190

Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr
195 200 205

Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala
210 215 220

Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile
225 230 235 240

Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn

245 250 255

Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu

260 265 270

Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Cys Ile Leu Asp

275 280 285

Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe

290 295 300

Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp

305 310 315 320

Met Thr Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr

325 330 335

Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr

340 345 350

Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala

355 360 365

Glu Ala Met Ser His Val Thr Asn Pro Thr Asn Ile Met Met Gln Gly

370 375 380

Gly Asn Phe Arg Ser Gln Lys Lys Met Val Lys Cys Phe Asn Cys Gly

385 390 395 400

Lys Val Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly

405 410 415

Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Asn Glu

420 425 430

Arg Gln Gly Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys

435 440 445

Gly Arg Pro Gly Asn Phe Leu Gln Asn Arg Thr Glu Pro Thr Ala Pro

450 455 460

Pro Glu Glu Ile Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln

465 470 475 480

Lys Gln Gly Pro Met Asp Lys Glu Gln Tyr Pro Leu Thr Ser Leu Arg

485 490 495

Ser Leu Phe Gly Ser Asp Pro Ser Ser Gln

500 505

<210> 64

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 64

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Tyr

20 25 30

His Ile Val Trp Ala Ser Arg Glu Ile Glu Gly Leu Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Glu Ile Leu Gly Gln Leu

50 55 60

His Pro Ser Leu Gln Thr Gly Ser Glu Glu Phe Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Asn Ser

115 120 125

Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln

130 135 140

Met Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys

145 150 155 160

Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser

165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn

180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Ile Leu Lys Glu Thr Ile

195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly

210 215 220

Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala

225 230 235 240

Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn

245 250 255

Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Met Gly

260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile

275 280 285

Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr

290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met

305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile

325 330 335

Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala

340 345 350

Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu

355 360 365

Ala Met Ser Gln Val Thr Asn Pro Ala Thr Ile Met Ile Gln Lys Gly

370 375 380

Asn Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys

385 390 395 400

Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys

405 410 415

Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg

420 425 430

Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro

435 440 445

Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu

450 455 460

Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu

465 470 475 480

Pro Ile Asp Arg Glu Met Tyr Pro Ser Thr Ser Leu Lys Ser Leu Phe

485 490 495

Gly Asn Asp Pro

500

<210> 65

<211> 505

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (51)..(51)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (143)..(143)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (341)..(341)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (397)..(397)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (403)..(403)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (463)..(463)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (483)..(483)

<223> Xaa can be any naturally occurring amino acid

<400> 65

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Gln Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Xaa Glu Thr Ala Gln Gly Cys Arg Gln Ile Leu Gln Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Thr Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Asn Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Arg Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Glu Gln Ala Ala Ala Asp Thr Arg Ser Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Xaa His
130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Val Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Xaa Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Xaa Glu Gly His
385 390 395 400
Ile Ala Xaa Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415

Gly Gln Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Asp Ser Xaa Arg
450 455 460

Phe Ala Glu Gln Thr Ala Thr Pro Gln Thr Ala Thr Pro Ser Gln Lys
465 470 475 480

Gln Glu Xaa Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser
485 490 495

Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 66

<211> 506

<212> PRT

<213> Human immunodeficiency virus

<400> 66

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Ser Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Arg Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Asp Thr Gly Asn Ser Ser Thr
115 120 125

Gly Asn Gly Ser Lys Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu
130 135 140

Gln Gly Gln Met Val His Gln Thr Leu Ser Pro Arg Thr Leu Asn Ala
145 150 155 160

Trp Val Lys Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Ile Ile Pro
165 170 175
Met Phe Thr Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr
180 185 190
Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys
195 200 205
Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Pro
210 215 220

Gln Ala Gly Pro Val Ala Pro Gly Gln Ile Arg Asp Pro Arg Gly Ser
225 230 235 240
Asp Ile Ala Gly Thr Thr Ser Asn Leu Gln Glu Gln Ile Ala Trp Met
245 250 255
Thr Asn Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile
260 265 270
Ile Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile
275 280 285

Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp
290 295 300
Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys
305 310 315 320
Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys
325 330 335
Lys Thr Ile Leu Lys Ala Leu Gly Pro Gly Ala Ser Leu Glu Glu Met
340 345 350

Met Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val
355 360 365
Leu Ala Glu Ala Met Ser Gln Val Thr Asn Ser Thr Ala Ile Met Met
370 375 380
Gln Lys Gly Asn Phe Arg Asn Gln Arg Arg Thr Ile Lys Cys Phe Asn
385 390 395 400
Cys Gly Lys Glu Gly His Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys

405 410 415

Lys Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys
420 425 430
Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys
435 440 445
Gly Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro
450 455 460
Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln
465 470 475 480

Lys Gln Glu Pro Ile Asp Lys Glu Met Tyr Pro Leu Ala Ser Leu Lys
485 490 495
Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 67
<211> 503
<212> PRT
<213> Human immunodeficiency virus
<400> 67
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Ala Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr His Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gln Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Lys Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Thr Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Ile Asn Pro Thr Thr Val Met Met Gln Arg Gly Asn Phe Arg Asn
370 375 380

Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile
385 390 395 400

Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly
405 410 415

Gln Glu Gly His Gln Met Lys Asp Cys Asn Glu Arg Gln Ala Asn Phe
420 425 430

Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn Phe Leu
435 440 445

Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro Glu Glu Ser
450 455 460

Phe Arg Phe Gly Glu Glu Thr Thr Thr Ala Pro Ser Gln Lys Gln Glu
465 470 475 480

Pro Ile Asp Lys Gly Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe
485 490 495

Gly Asn Asp Pro Ser Ser Gln
500

<210> 68

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<400> 68

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ala Leu Arg Thr Gly Ser Glu Glu Leu Arg Ser Val Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Ala Asp Thr Gly Lys Asn
115 120 125

Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln
130 135 140

Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160

Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser
165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly
210 215 220

Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240

Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn
245 250 255

Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly
260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile
275 280 285

Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met
305 310 315 320
Thr Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile
325 330 335
Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350

Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu
355 360 365
Ala Met Ser Asn Val Thr Asn Ser Thr Thr Ile Met Met Gln Lys Gly
370 375 380
Asn Phe Arg Asn Gln Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Lys
385 390 395 400
Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys
405 410 415

Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg
420 425 430
Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro
435 440 445
Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu
450 455 460
Ser Phe Arg Phe Gly Glu Glu Lys Ala Thr Pro Ser Gln Lys Gln Glu
465 470 475 480

Pro Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe
485 490 495
Gly Asn Asp Pro Ser Ser Gln
500

<210> 69
<211> 501
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (124)..(124)

<223> Xaa can be any naturally occurring amino acid

<400> 69

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Met Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Ala Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Ala Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Xaa Gly Ser Ser Ser
115 120 125

Gln Val Ser Arg Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140

Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160

Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala
165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro
210 215 220

Val Ala Pro Gly Gln Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Gly Asn Pro

245 250 255

Ala Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Ser Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Ala Thr Ser Ala Ala Thr Ile Met Met Gln Lys Gly Asn

370 375 380

Phe Arg Ser Gln Gly Lys Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ser Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Asn Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Val Trp Pro Ser His Lys Gly Arg Pro Gly Asn

435 440 445

Phe Val Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Ala Glu Ser Phe

450 455 460

Met Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Val

465 470 475 480

Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Ser
485 490 495
Asp Pro Ser Ser Gln
500

<210> 70
<211> 502
<212> PRT
<213> Human immunodeficiency virus
<400> 70

Met Gly Ala Arg Ala Ser Ile Ile Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Asn Lys Lys Tyr Arg Leu Lys
20 25 30
His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Ile Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Leu Arg Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Leu Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Lys Ser Ser Gly Asn
115 120 125
Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln His
130 135 140

Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160
Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala
165 170 175
Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn

195 200 205

Glu Glu Ala Ala Asp Trp Asp Arg Leu His Pro Val His Ala Gly Pro

210 215 220

Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro

245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Ile Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Ile Leu Ala Glu Ala

355 360 365

Met Ser Gln Val Thr Asn Pro Thr Thr Ile Met Met Gln Arg Gly Asn

370 375 380

Phe Arg Asn Gln Arg Arg Pro Ile Lys Cys Phe Asn Cys Gly Lys Glu

385 390 395 400

Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Ser Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly
435 440 445
Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser
450 455 460

Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Thr
465 470 475 480
Val Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly
485 490 495
Asn Asp Pro Ser Ser Gln
500

<210> 71
<211> 501
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (280)..(280)
<223> Xaa can be any naturally occurring amino acid
<400> 71
Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Gln Leu Asp Arg Trp

1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30
His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Leu Asp Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gly Gly Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Asn Ser Ser

115 120 125

Pro Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met

130 135 140

Val His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala

165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn

195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro

210 215 220

Val Ala Pro Gly Gln Leu Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro

245 250 255

Pro Ile Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Xaa Pro Thr Ser Ile Leu Asp Ile Lys

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Val Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Ser His Lys Ala Lys Val Leu Ala Glu Ala

355 360 365

Met Gly Gln Val Thr Ser Ser Ala Thr Ile Met Met Gln Lys Gly Asn

370 375 380

Phe Arg Asp Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Thr

385 390 395 400

Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser

450 455 460

Phe Arg Phe Gly Glu Glu Ala Thr Ala Pro Ser Pro Lys Pro Glu Pro

465 470 475 480

Ile Asp Glu Met Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn

485 490 495

Asp Pro Ser Ser Gln

500

<210> 72

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (388)..(388)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (482)..(482)

<223> Xaa can be any naturally occurring amino acid

<400> 72

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Thr Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60
Gln Pro Ala Leu Lys Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Ala Ile Glu Val Arg Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Asn Lys Ala Gln Gln Ala Ala Ala Asp Ala Gly Asn Asn Asn Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Met Thr Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Leu Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Asn Thr Thr Ser Ile Met Met Gln Arg Gly Asn Phe Arg Asn

370 375 380

Gln Arg Lys Xaa Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile

385 390 395 400

Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415

Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Ser Arg Pro Glu Pro Thr Ala Pro Leu Glu Glu Ser Phe Gly Phe

450 455 460

Gly Glu Glu Thr Ile Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp Lys

465 470 475 480

Gly Xaa Tyr Pro Ser Val Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro

485 490 495

Leu Ser Gln

<210> 73

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 73

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Lys Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Ser Gln
115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val
130 135 140

His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val
145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu
165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu
195 200 205

Glu Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile

210 215 220

Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr

225 230 235 240

Thr Ser Thr Leu Gln Glu Gln Ile Glu Trp Met Thr His Asn Pro Pro

245 250 255

Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln

275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys

325 330 335

Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Ser Gln Ala Thr Asn Thr Asn Ile Met Leu Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Leu Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Leu Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Leu Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Thr Asp
465 470 475 480
Lys Glu Val Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Thr
500

<210> 74
<211> 501
<212> PRT
<213> Human immunodeficiency virus
<400> 74

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Val Gln Gln Ala Ala Ala Asp Ser Gly Asn Ser Asp Ser Gln
115 120 125
Val Ser Lys Asn Phe Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val
130 135 140
His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val
145 150 155 160
Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu

165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190
Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu
195 200 205
Glu Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile
210 215 220
Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
225 230 235 240

Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro
245 250 255
Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn
260 265 270
Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln
275 280 285
Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr
290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu
305 310 315 320
Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys
325 330 335
Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln
340 345 350
Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met
355 360 365

Asn Gln Val Thr Asn Pro Thr Ser Ile Met Met Gln Arg Gly Asn Phe
370 375 380
Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly
385 390 395 400
His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys
405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Ser Glu Arg Gln Ala
420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn
435 440 445

Phe Pro Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe
450 455 460

Arg Phe Gly Glu Glu Thr Thr Ala Pro Ser Leu Lys Gln Glu Pro Ile
465 470 475 480

Asn Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn
485 490 495

Asp Pro Ser Ser Gln
500

<210> 75

<211> 505

<212> PRT

<213> Human immunodeficiency virus

<400> 75

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Ser Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Ala Gly Thr Gly Asn Ser
115 120 125
Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln
130 135 140
Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160
Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser
165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190
Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205
Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly
210 215 220
Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240

Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn
245 250 255
Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly
260 265 270
Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile
275 280 285
Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met
305 310 315 320
Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile
325 330 335
Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350
Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu

355 360 365

Ala Met Ser Ser Ala Asn Ser Ala Ala Ile Met Met Gln Lys Gly Asn
370 375 380
Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400
Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp
405 410 415
Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln
420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly
435 440 445
Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro
450 455 460
Ala Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys
465 470 475 480
Gln Glu Pro Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser
485 490 495

Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 76
<211> 501
<212> PRT
<213> Human immunodeficiency virus
<400> 76
Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Lys Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Ile
20 25 30
His Ile Val Trp Ala Ser Arg Glu Val Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Phe Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80
Thr Ile Ala Thr Leu Tyr Cys Val His Gln Asn Ile Asp Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Arg Ala Gln Gln Ala Ala Ala Ala Asp Thr Gly Asn Asn Lys Gln
115 120 125
Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val
130 135 140
His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val
145 150 155 160
Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu
165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190
Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu
195 200 205
Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile
210 215 220
Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
225 230 235 240

Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro
245 250 255
Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Ile Asn
260 265 270
Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln
275 280 285
Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr
290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu
305 310 315 320
Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys
325 330 335
Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln
340 345 350
Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met
355 360 365

Ser Gln Val Thr Asn Pro Ala Thr Ile Met Ile Gln Lys Gly Asn Phe
370 375 380
Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly
385 390 395 400
His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys
405 410 415
Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala
420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn
435 440 445
Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ile Phe
450 455 460
Arg Phe Gly Glu Glu Thr Ala Thr Pro Pro Gln Lys Gln Glu Pro Ile
465 470 475 480
Asp Lys Glu Leu Tyr Pro Ser Ala Ser Leu Arg Ser Leu Phe Gly Asn
485 490 495

Asp Pro Ser Ser Gln
500

<210> 77
<211> 503
<212> PRT
<213> Human immunodeficiency virus
<400> 77
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Thr Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Met Gly His Leu

50 55 60

His Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Ala Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Arg Val Glu Glu Glu Gln Asn Lys Cys Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asn Thr Glu Thr Asn Thr Gly Asn

115 120 125

Ser Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly

130 135 140

Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val

145 150 155 160

Lys Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe

165 170 175

Ser Ala Leu Ser Glu Gly Ala Thr Pro Ala Asp Leu Asn Thr Met Leu

180 185 190

Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr

195 200 205

Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Ala Gln Ala

210 215 220

Gly Pro Val Ala Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile

225 230 235 240

Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Thr Trp Met Thr Asn

245 250 255

Asn Pro Pro Ile Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu
260 265 270
Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp
275 280 285
Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe
290 295 300

Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp
305 310 315 320
Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr
325 330 335
Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr
340 345 350
Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala
355 360 365

Glu Ala Met Ser His Val Asn Ser Ala Ala Ile Met Met Gln Lys Gly
370 375 380
Asn Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys
385 390 395 400
Glu Gly His Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys
405 410 415
Trp Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg
420 425 430

Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro
435 440 445
Gly Asn Phe Leu Gln Asn Arg Thr Glu Pro Ser Ala Pro Pro Glu Glu
450 455 460
Ile Phe Gly Phe Gly Glu Glu Ala Ala Ala Pro Pro Gln Lys Gln Glu
465 470 475 480
Pro Ile Asp Lys Glu Lys Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe
485 490 495

Gly Asn Asp Pro Ser Ser Gln

500

<210> 78

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 78

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Arg Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asn Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

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Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
    210                 215                 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225                 230                 235                 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
                245                 250                 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
            260                 265                 270
Ile Val Arg Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile Arg Gln Gly
        275                 280                 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
    290                 295                 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305                 310                 315                 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
                325                 330                 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
            340                 345                 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
        355                 360                 365

Gln Val Thr Asn Ser Gly Thr Ile Met Met Gln Arg Gly Asn Leu Arg
    370                 375                 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Arg Glu Gly His
385                 390                 395                 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Arg Arg Gly Cys Trp Lys Cys
                405                 410                 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
            420                 425                 430

Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe
        435                 440                 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
```

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 79

<211> 506

<212> PRT

<213> Human immunodeficiency virus

<400> 79

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ala His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ala Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Ser Ala Pro Pro Ala Glu

450 455 460

Ser Phe Arg Phe Gly Glu Glu Ile Thr Thr Pro Pro Gln Lys Gln Glu

465 470 475 480

Thr Leu Ile Asp Leu Asp Lys Glu Leu Tyr Pro Ser Ala Ser Leu Lys

485 490 495

Ser Leu Phe Gly Asn Asp Pro Leu Leu Lys

500 505

<210> 80

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<400> 80

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Glu Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser Lys
115 120 125

Gln Val Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Val Gln Gly Gln
130 135 140

Met Val His Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160

Val Val Glu Glu Arg Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr
165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190

Thr Ile Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly
210 215 220

Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240

Gly Thr Thr Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn
245 250 255

Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly
260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile
275 280 285

Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met
305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys His Ile
325 330 335

Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350

Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu
355 360 365

Ala Met Ser Gln Val Thr Ser Ser Thr Thr Ile Met Met Gln Arg Gly
370 375 380
Asn Phe Lys Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys
385 390 395 400
Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys
405 410 415
Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg
420 425 430

Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro
435 440 445
Gly Asn Phe Leu Gln Asn Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu
450 455 460
Ser Phe Arg Cys Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu
465 470 475 480
Thr Ile Asp Lys Asp Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe
485 490 495

Gly Ser Asp Pro Ser Ser Gln
500

<210> 81
<211> 504
<212> PRT
<213> Human immunodeficiency virus
<400> 81
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Ile Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Phe Arg Ser Leu Tyr Asn
65 70 75 80
Ala Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Val Gln Gln Ala Ala Ala Ala Thr Ala Ala Ala Gly Asn Ser
115 120 125
Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln
130 135 140
Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160
Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala
165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Leu Met Leu Asn
180 185 190
Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205
Asn Glu Glu Ala Ala Asp Trp Asp Arg Leu His Pro Ala Gln Ala Gly
210 215 220
Pro Val Ala Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240

Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Thr Trp Met Thr Ser Asn
245 250 255
Pro Pro Ile Gln Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly
260 265 270
Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile
275 280 285
Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr

290 295 300

Arg Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met
305 310 315 320
Thr Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile
325 330 335
Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350
Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu
355 360 365

Ala Met Ser Gln Leu Thr Asn Thr Thr Asn Ile Met Met Gln Lys Gly
370 375 380
Asn Phe Arg Asn Gln Arg Arg Ser Ile Lys Cys Phe Asn Cys Gly Lys
385 390 395 400
Glu Gly His Thr Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys
405 410 415
Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg
420 425 430

Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro
435 440 445
Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu
450 455 460
Ile Phe Arg Phe Gly Glu Glu Thr Thr Thr Asn Pro Ser Gln Lys Gln
465 470 475 480
Glu Met Val Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu
485 490 495

Phe Gly Asn Asp Pro Ser Ser Gln
500

<210> 82
<211> 506
<212> PRT
<213> Human immunodeficiency virus

<400> 82

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Glu Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Gly Ile Glu Val Gly Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Val Ala Ala Ala Gln Pro Ala Ala Ala Val Thr
115 120 125

Gly Asn Ser Asn Gln Ile Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu
130 135 140

Gln Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala
145 150 155 160

Trp Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro
165 170 175

Met Phe Ala Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr
180 185 190

Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys
195 200 205

Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val
210 215 220

His Ala Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser
225 230 235 240

Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met
245 250 255
Thr Asn Asn Pro Ala Ile Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile
260 265 270
Ile Met Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Ala Ser Ile
275 280 285
Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp
290 295 300

Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys
305 310 315 320
Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys
325 330 335
Lys Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met
340 345 350
Met Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val
355 360 365

Leu Ala Glu Ala Met Ser Gln Ala Thr Asn Gln Ala Thr Ile Met Met
370 375 380
Gln Lys Gly Asn Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn
385 390 395 400
Cys Gly Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys
405 410 415
Lys Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys
420 425 430

Thr Glu Arg Gln Val Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys
435 440 445
Gly Arg Pro Gly Asn Phe Leu Gln Ser Arg Leu Glu Pro Thr Ala Pro
450 455 460
Pro Ala Glu Ser Phe Arg Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln
465 470 475 480
Lys Gln Glu Thr Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys

485 490 495

Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 83
<211> 507
<212> PRT
<213> Human immunodeficiency virus
<400> 83

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Ile Lys Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His
130 135 140
Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Thr Pro Pro Ala Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Pro Arg Lys Val Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Pro Thr Ala Pro
450 455 460
Pro Ala Ala Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln
465 470 475 480
Lys Gln Glu Pro Pro Val Asp Arg Glu Leu Tyr Pro Leu Ala Ser Leu
485 490 495

Lys Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 84
<211> 499
<212> PRT
<213> Human immunodeficiency virus
<400> 84
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Arg Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Asn

100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Arg Ser Gln Ala
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Thr Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Asn Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Gln Thr Ser Thr Ala Met Met Met Gln Gly Ser Asn His Arg

370 375 380

Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Val Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Asn Pro Pro Gln Lys Gln Glu Pro Ile Asp
465 470 475 480
Glu Leu Tyr Pro Met Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro

485 490 495
Ser Ser Gln

<210> 85
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<400> 85
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Lys Trp
1 5 10 15
Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Arg Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Ile Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Ser Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365
Gln Met Thr Pro Pro Pro Thr Val Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Gly Gln Arg Lys Val Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Lys
450 455 460
Phe Gly Gly Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Thr Val Asp
465 470 475 480
Lys Asp Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495
Pro Ser Ser Gln
500

<210> 86
<211> 502
<212> PRT
<213> Human immunodeficiency virus
<400> 86
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ala Leu Arg Thr Gly Ser Glu Glu Phe Arg Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Gly Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Val Ala Ala Asp Thr Glu Asn Lys Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His

130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Ser Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Pro Gln Ser Arg Thr Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Gly Gln Gly Pro

465 470 475 480

Ile Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln

500

<210> 87

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 87

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Phe Arg Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Gln Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Thr Ala Ala Gly Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His
130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Met Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Asp Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Ala Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Arg Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Asp Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ser Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Thr Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Arg Pro Glu Ser Ile Asp

465 470 475 480

Lys Glu Met Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 88

<211> 497

<212> PRT

<213> Human immunodeficiency virus

<400> 88

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Arg Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Thr Ala Ala Ala Asp Thr Gly Asn Asn Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Ile Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Thr Ala Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Asn Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Lys Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro

<210> 89

<211> 507

<212> PRT

<213> Human immunodeficiency virus

<400> 89

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Gln Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ala Leu Lys Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Arg Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Ala Ala Gln Pro Ala Ala Ala Ala Ala Ala Ala Gly Asn Ser Ser
115 120 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140

Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160

Val Glu Glu Lys Ala Phe Asn Pro Glu Val Ile Pro Met Phe Ala Ala
165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205

Asp Glu Ala Ala Glu Trp Asp Arg Thr His Pro Val His Ala Gly Pro
210 215 220

Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro
245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Leu Gly Leu
260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys
275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
290 295 300

Thr Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr
305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Val Thr Asn Ser Thr Ala Ile Met Met Gln Arg Gly Asn
370 375 380
Tyr Lys Gly Gln Arg Lys Ala Val Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400
Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp
405 410 415
Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln
420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly
435 440 445
Asn Phe Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Val Glu Pro Thr
450 455 460
Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Gly Thr Thr Pro Ser
465 470 475 480
Leu Lys Gln Glu Pro Thr Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu
485 490 495

Lys Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 90
<211> 498
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (127)..(127)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (413)..(413)
<223> Xaa can be any naturally occurring amino acid
<400> 90
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Ile Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Lys Glu Val Arg Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Gly Thr Gly Asn Ser Ser Xaa Thr
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ser Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Pro Val Asn Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Xaa Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Asn Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460

Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Glu Ser Ile Asp
465 470 475 480
Lys Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser
485 490 495
Ser Gln

<210> 91

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 91

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Arg Ala Gln Gln Ala Ala Ala Asp Thr Lys Asn Asn Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Val Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Ile Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Ser Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Lys Arg Pro Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Ala Ala Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Thr Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 92

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 92

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Glu Lys Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu His Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

His Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Lys

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Asn Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Ala Thr Pro Pro Gln Lys Gln Glu Pro Arg Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 93

<211> 500

<212> PRT

<213> Human immunodeficiency virus

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<400> 93

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1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Xaa Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Xaa Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Lys Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Xaa Leu Tyr Cys Xaa His Gln Arg Ile Glu Xaa Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Met Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Asn Lys Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Xaa Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gly Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Xaa His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Xaa Gln Glu Gln Ile Ala Trp Met Thr Ala Asn Pro Pro Ile

245 250 255

Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Xaa Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Xaa Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Xaa Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Arg Glu Gly Xaa Gln Met Lys Asp Xaa Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Cys Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Xaa Ile Asp

465 470 475 480

Lys Glu Met Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 94

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 94

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Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
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His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asn Thr Gly Asn Gly Ser Pro Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Ala Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Val Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Gly Thr Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 95

<211> 500

<212> PRT

<213> Human immunodeficiency virus

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

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1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Asn Ile Asp Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Val Glu Xaa Glu Gln Asn Gln Ser Lys
100 105 110

Xaa Lys Ala Gln Gln Ala Ala Xaa Ala Ala Asp Xaa Arg Asn Ser Cys
115 120 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140

Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Xaa Ala
165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Xaa Leu Asn Thr Met Leu Asn Thr
180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Xaa Leu Lys Glu Thr Ile Asn
195 200 205

Glu Glu Ala Ala Xaa Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro
210 215 220

Val Ala Pro Gly Gln Leu Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Xaa Trp Met Thr His Asn Pro
245 250 255

Pro Ile Pro Val Gly Glu Xaa Tyr Lys Xaa Trp Ile Ile Met Gly Leu
260 265 270

Xaa Lys Ile Val Arg Met Tyr Ser Pro Xaa Ser Ile Leu Asp Ile Arg
275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr
305 310 315 320
Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335
Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Asp Met Met Thr Ala Cys
340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365
Met Ser Gln Val Thr Asn Ser Ala Xaa Val Met Met Gln Lys Gly Asn
370 375 380
Phe Arg Asn Gln Arg Lys Xaa Val Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400
Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp
405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln
420 425 430
Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly
435 440 445
Asn Phe Pro Gln Ser Arg Leu Glu Pro Thr Ala Pro Pro Glu Glu Ser
450 455 460
Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Gly Ser
465 470 475 480

Xaa Asp Lys Asn Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln
500

<210> 96
<211> 500
<212> PRT
<213> Human immunodeficiency virus
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<400> 96

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Xaa Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Xaa Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Xaa Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Glu Lys Ala Arg Gln Xaa Ala Ala Asp Thr Gly Asn Lys Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Xaa Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Xaa Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Ile Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Xaa Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile

245 250 255

Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Xaa Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Xaa Thr

305 310 315 320

Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Xaa Met Met Gln Lys Ser Asn Phe Arg

370 375 380

Asn Gln Arg Lys Val Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Xaa Arg Pro Xaa Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Xaa Thr Thr Pro Xaa Gln Lys Gln Xaa Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Xaa Thr Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Leu Gln

500

<210> 97

<211> 497

<212> PRT

<213> Human immunodeficiency virus

<400> 97

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Gln Leu Asp Arg Trp

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Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Lys Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys

100 105 110

Lys Lys Ala Gln Gln Val Thr Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His

130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Thr Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Thr His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Thr Gly Ala Asn Thr Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Gln Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Glu Glu Ile Thr Pro Pro Gln Lys Gln Glu Pro Arg Asp Lys Glu Met

465 470 475 480

Tyr Pro Leu Val Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Ser Ser

485 490 495

Gln

<210> 98

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<400> 98

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

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Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Thr Tyr Lys Leu Lys

20 25 30

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        35                  40                  45
Gly Leu Leu Glu Thr Ser Val Gly Cys Arg Gln Ile Leu Gly Gln Leu
    50                  55                  60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65                  70                  75                  80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Ile Arg Asp
                85                  90                  95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
            100                 105                 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
        115                 120                 125
Ser His Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
    130                 135                 140
Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145                 150                 155                 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
                165                 170                 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
            180                 185                 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
        195                 200                 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala
    210                 215                 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225                 230                 235                 240
Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Pro Ile
                245                 250                 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
            260                 265                 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
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275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Asp Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ser Ala Thr Ile Met Met Gln Gly Gly Lys Phe
370 375 380
Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly
385 390 395 400
His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys
405 410 415

Cys Gly Gln Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala
420 425 430
Asn Phe Leu Gly Lys Ile Trp Pro Ser Cys Lys Gly Arg Pro Gly Asn
435 440 445
Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe
450 455 460
Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Ser Ile
465 470 475 480

Asp Lys Glu Arg Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn
485 490 495
Asp Pro Leu Ser Gln
500

<210> 99
<211> 505

<212> PRT

<213> Human immunodeficiency virus

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<400> 99

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Lys Trp

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Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Lys Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Pro Ala Ala Ala Asp Thr Gly Asn Ser Gly Gln Val

115 120 125

Ser Gln Asn Phe Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Xaa Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Xaa Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Val Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Arg Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Asn Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn
435 440 445
Phe Leu Gln Asn Arg Pro Glu Pro Arg Pro Glu Pro Thr Ala Pro Pro

450 455 460
Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Ala Thr Pro Pro Gln Lys
465 470 475 480
Gln Glu Pro Thr Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser
485 490 495
Leu Phe Gly Asn Asp His Ser Ser Gln
500 505

<210> 100
<211> 502
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
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222> (26)..(26)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (375)..(375)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (391)..(391)
<223> Xaa can be any naturally occurring amino acid
<400> 100
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Xaa Lys Lys Tyr Gln Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Thr Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Ser Ser Ser
115 120 125
Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met
130 135 140
Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala
165 170 175
Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
180 185 190
Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205
Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro
210 215 220

Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240
Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro
245 250 255
Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu
260 265 270
Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg
275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
290 295 300
Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Val Thr Asn Xaa Ala Thr Val Met Met Gln Arg Gly Asn

370 375 380

Leu Arg Asn Gln Arg Lys Xaa Val Lys Cys Phe Asn Cys Gly Lys Glu

385 390 395 400

Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Arg Lys Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser

450 455 460

Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Thr

465 470 475 480

Ile Asp Lys Glu Arg Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln

500

<210> 101

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (31)..(31)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (46)..(46)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (51)..(51)

<223> Xaa can be any naturally occurring amino acid

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<222> (55)..(55)

<223> Xaa can be any naturally occurring amino acid

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<220><221> misc_feature

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<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

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<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (197)..(197)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (261)..(261)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (283)..(283)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (290)..(290)

<223> Xaa can be any naturally occurring amino acid

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<222> (295)..(295)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (312)..(312)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (329)..(329)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

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<223> Xaa can be any naturally occurring amino acid

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<222> (415)..(415)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (422)..(422)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (425)..(425)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (446)..(446)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (470)..(470)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (472)..(472)

<223> Xaa can be any naturally occurring amino acid

<400> 101

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Xaa Lys
20 25 30

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His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Xaa Asn Pro
        35                  40                  45
Gly Leu Xaa Glu Thr Ser Xaa Gly Cys Arg Gln Ile Ile Arg Gln Leu
    50                  55                  60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65                  70                  75                  80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
                85                  90                  95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Xaa Lys
            100                 105                 110
Lys Xaa Ala Gln Pro Ala Ala Ala Asp Thr Gly Ser Thr Ser Gln Val
        115                 120                 125
Ser Gln Asn Tyr Pro Ile Val Gln Xaa Met Gln Gly Gln Met Val His
    130                 135                 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145                 150                 155                 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
                165                 170                 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
            180                 185                 190
Gly His Gln Ala Xaa Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
        195                 200                 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
    210                 215                 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225                 230                 235                 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile
                245                 250                 255
Pro Val Gly Glu Xaa Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
            260                 265                 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Xaa Asp Ile Arg Gln Gly
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275 280 285

Pro Xaa Glu Pro Phe Arg Xaa Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Xaa Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Xaa Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly Xaa Lys Ala Arg Ile Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Pro Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Xaa Cys

405 410 415

Gly Lys Glu Gly His Xaa Met Lys Xaa Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Xaa Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Xaa Thr Xaa Pro Gln Lys Gln Glu Pro Thr Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 102

<211> 508

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (41)..(41)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (117)..(117)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (122)..(122)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (242)..(242)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (491)..(491)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (495)..(495)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (506)..(506)

<223> Xaa can be any naturally occurring amino acid

<400> 102

Met Gly Ala Arg Ala Ser Ile Leu Thr Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Val Val Trp Ala Ser Arg Glu Xaa Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Val Leu Phe Cys Val His Gln Lys Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Asn Lys Ala Gln Xaa Ala Ala Ala Ala Xaa Ala Asp Thr Gly Asn Gly

115 120 125

Ser Lys Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln

130 135 140

Met Val His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys

145 150 155 160

Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser

165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn

180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile

195 200 205

Asn Glu Glu Ala Ala Asp Trp Asp Arg Leu His Pro Val His Ala Gly

210 215 220

Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala

225 230 235 240

Gly Xaa Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn

245 250 255

Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly

260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile

275 280 285

Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr

290 295 300

Lys Ile Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met

305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile
325 330 335
Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350
Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu
355 360 365
Ala Met Ser Gln Val Thr Thr Ala Ser Ala Ala Ile Met Met Gln Lys

370 375 380
Gly Asn Phe Arg Thr Pro Arg Lys Thr Val Lys Cys Phe Asn Cys Gly
385 390 395 400
Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly
405 410 415
Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu
420 425 430
Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg

435 440 445
Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu
450 455 460
Glu Ser Phe Arg Phe Arg Glu Glu Ala Thr Thr Pro Ser Gln Lys Gln
465 470 475 480
Glu Pro Ile Asp Lys Glu Ile Asp Lys Glu Xaa Tyr Pro Leu Xaa Ser
485 490 495
Leu Arg Ser Leu Phe Gly Asn Asp Pro Xaa Ser Gln

500 505

<210> 103
<211> 508
<212> PRT
<213> Human immunodeficiency virus
<400> 103
Met Gly Ala Arg Ala Ser Val Leu Ser Ala Gly Glu Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

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            20                  25                  30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
        35                  40                  45

Gly Leu Leu Glu Thr Ser Val Gly Cys Arg Gln Ile Leu Gly Gln Leu
    50                  55                  60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65                  70                  75                  80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Arg Asp
                85                  90                  95
Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Cys Lys
            100                 105                 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser Ser
        115                 120                 125
Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
    130                 135                 140
Val His Gln Pro Ile Ser Ala Arg Thr Leu Asn Ala Trp Val Lys Val
145                 150                 155                 160
Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala
                165                 170                 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
            180                 185                 190
Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
        195                 200                 205
Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro
    210                 215                 220
Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225                 230                 235                 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro
                245                 250                 255
Pro Val Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu
            260                 265                 270
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Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg
275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr
305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335

Lys Ala Leu Gly Pro Gly Ala Ser Leu Glu Glu Met Met Thr Ala Cys
340 345 350

Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365

Met Ser Gln Ala Thr Asn Ser Thr Ala Val Met Met Gln Arg Gly Asn
370 375 380

Phe Lys Asn Gln Arg Lys Ile Ile Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400

Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp
405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln
420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly
435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Ala Glu Pro Ser
450 455 460

Ala Pro Pro Ala Glu Ser Phe Arg Phe Gly Glu Glu Thr Ala Thr Pro
465 470 475 480

Ser Gln Lys Gln Glu Gln Ile Asp Lys Glu Met Tyr Pro Leu Ala Ser
485 490 495

Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 104

<211> 504

<212> PRT

<213> Human immunodeficiency virus

<400> 104

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Asp Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Ala Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Val Gln Gln Ala Ala Ala Asp Thr Gly Asn Asn Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Ile Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala
210 215 220

Pro Gly Gln Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Met Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Thr Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ala His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Leu Thr Pro Ala Thr Val Met Met Gln Lys Gly Asn Phe Arg Asn

370 375 380

Ser Arg Lys Ser Val Lys Cys Phe Asn Cys Gly Arg Glu Gly His Ile

385 390 395 400

Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415

Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser Asn Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Asn Arg Pro Glu Pro Thr Ala Pro Glu Pro Thr Ala Pro Pro Leu

450 455 460

Glu Ser Phe Arg Phe Gly Glu Glu Ala Thr Ala Pro Pro Gln Arg Gln

465 470 475 480

Glu Pro Ile Asp Arg Glu Leu Tyr Pro Ser Ala Ser Leu Lys Ser Leu

485 490 495

Phe Gly Asn Asp Pro Ser Ser Gln

500

<210> 105

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 105

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Val Leu Phe Cys Val His Gln Lys Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Val Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Pro Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Arg Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His

130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Met His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Glu Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Met Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Ser Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Ile Thr Thr Pro Pro Gln Lys Gln Glu Pro Val Asp

465 470 475 480

Lys Glu Met Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 106

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<400> 106

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Ser Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

His Pro Ser Leu Lys Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Asp Thr Asn Ser Pro Val Ser
115 120 125
Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln
130 135 140
Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu
145 150 155 160
Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu

165 170 175
Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly
180 185 190
His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala
195 200 205
Ala Glu Trp Asp Arg Thr His Pro Val Gln Ala Gly Pro Val Ala Pro
210 215 220
Gly Gln Val Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser

225 230 235 240
Thr Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro Pro Ile Pro
245 250 255
Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile
260 265 270
Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly Pro
275 280 285
Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg

290 295 300
Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu
305 310 315 320
Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu
325 330 335
Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val
340 345 350
Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln

355 360 365

Val Thr Asn Ser Thr Ala Ile Met Met Gln Arg Gly Asn Phe Lys Gly

370 375 380

Gln Arg Lys Asn Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile

385 390 395 400

Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415

Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser Gln Arg Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Ser Arg Pro Glu Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu

450 455 460

Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu

465 470 475 480

Pro Ile Asp Lys Glu Met Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe

485 490 495

Gly Asn Asp Pro Ser Ser Gln

500

<210> 107

<211> 507

<212> PRT

<213> Human immunodeficiency virus

<400> 107

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Thr Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Ala Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110
Lys Lys Thr Gln Gln Ala Ala Ala Gly Thr Gly Asn Ser Thr Gly Asn
115 120 125
Ser Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly
130 135 140
Gln Met Val His Gln Ala Met Ser Pro Arg Thr Leu Asn Ala Trp Val
145 150 155 160
Lys Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe

165 170 175
Ala Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu
180 185 190
Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr
195 200 205
Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Ile His Pro Val His Ala
210 215 220
Gly Pro Val Ala Pro Gly Gln Met Arg Lys Pro Arg Gly Ser Asp Ile

225 230 235 240
Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser
245 250 255
Asn Pro Pro Val Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu
260 265 270
Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp
275 280 285
Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe

290 295 300
Tyr Lys Thr Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp

305 310 315 320

Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr

325 330 335

Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr

340 345 350

Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala

355 360 365

Glu Ala Met Ser Gln Val Thr Ser Ser Ala Thr Ile Met Met Gln Arg

370 375 380

Gly Asn Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly

385 390 395 400

Arg Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly

405 410 415

Cys Trp Lys Cys Gly Gln Glu Gly His Gln Met Lys Asp Cys Thr Glu

420 425 430

Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg

435 440 445

Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Val Pro Thr Ala

450 455 460

Pro Leu Glu Glu Ser Phe Arg Phe Gly Glu Gly Thr Thr Thr Pro Pro

465 470 475 480

Gln Lys Gln Asp Thr Ile Asp Lys Glu Leu Tyr Pro Ser Ala Ser Leu

485 490 495

Arg Ser Leu Phe Gly Asn Asp Pro Leu Leu Gln

500 505

<210> 108

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<400> 108

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Trp Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Ala Glu Glu Gln Asn Lys Cys Lys
100 105 110
Lys Lys Thr Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Ser Gln
115 120 125
Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ser Gln Gly Gln Met Val
130 135 140
His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val
145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu
165 170 175
Ser Glu Gly Ala Thr Pro His Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190
Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu
195 200 205
Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val
210 215 220

Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
225 230 235 240
Thr Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro
245 250 255
Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln

275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys

325 330 335

Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Ser Gln Val Thr Ser Pro Ala Thr Ile Met Met Gln Arg Gly Asn Phe

370 375 380

Lys Gly Gln Arg Lys Met Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Ile Lys Asp Cys Thr Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Leu

450 455 460

Arg Phe Arg Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Thr Thr

465 470 475 480

Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn

485 490 495

Asp Pro Leu Ser Gln

500

<210> 109

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (39)..(39)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (120)..(120)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (129)..(129)

<223

> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (145)..(145)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (180)..(180)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (201)..(201)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (203)..(203)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (261)..(261)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (271)..(271)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (306)..(306)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (312)..(312)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (331)..(331)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (481)..(482)

<223> Xaa can be any naturally occurring amino acid

<400> 109

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Ala Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Xaa Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Val Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Xaa Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Xaa Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Xaa Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ala

165 170 175

Glu Gly Ala Xaa Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Xaa Lys Xaa Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Xaa Tyr Lys Arg Trp Ile Ile Leu Gly Leu Xaa Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Xaa Glu Gln Ala Ser Gln Xaa Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Xaa Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Val Met Met Gln Arg Gly Asn Phe Lys

370 375 380

Asn Gln Gly Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Val Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Asp Lys Gln Ala Asn Phe
420 425 430
Leu Gly Lys Ile Trp Pro Ser His Lys Glu Arg Pro Gly Asn Phe Leu

435 440 445
Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg Phe
450 455 460
Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp Lys
465 470 475 480
Xaa Xaa Tyr Pro Met Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro
485 490 495
Ser Ser Gln

<210> 110
<211> 502

<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (408)..(408)
<223> Xaa can be any naturally occurring amino acid
<400> 110
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Asp Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Lys Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Phe Arg Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Ile Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asp Lys Cys Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asn Thr Gly Asn Ser Gly Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val Pro Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Ala Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Val Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Thr Asn Ile Asn Ala Ala Ala Met Met Met Gln Arg Gly Asn

370 375 380

Phe Asn Gly Pro Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Ile

385 390 395 400

Gly His Leu Ala Lys Asn Cys Xaa Ala Pro Arg Lys Lys Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Asn Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Asn Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser

450 455 460

Phe Arg Phe Gly Glu Glu Val Ala Thr Pro Ser Gln Lys Gln Glu Pro

465 470 475 480

Arg Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln

500

<210> 111

<211> 505

<212> PRT

<213> Human immunodeficiency virus

<400> 111

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Ile Arg Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asn Thr Gly Asn Gly Asn Gln Ala
115 120 125
Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln
130 135 140
Met Val His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160
Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala
165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190
Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205
Asn Glu Glu Ala Ala Glu Trp Asp Arg Met His Pro Val His Ala Gly
210 215 220
Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240

Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn
245 250 255
Pro Ala Ile Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Met Gly
260 265 270
Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile
275 280 285

Lys Gln Gly Pro Lys Glu Ser Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300

Lys Val Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met
305 310 315 320
Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile
325 330 335
Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350
Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu
355 360 365

Ala Met Cys Gln Val Thr Gly Ser Ala Thr Ala Ala Ile Met Met Gln
370 375 380
Lys Gly Asn Phe Lys Thr Gln Arg Lys Ile Val Lys Cys Phe Asn Cys
385 390 395 400
Gly Arg Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys
405 410 415
Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr
420 425 430

Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly
435 440 445
Arg Pro Gly Asn Phe Leu Gln Asn Arg Pro Glu Pro Ser Ala Pro Pro
450 455 460
Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys
465 470 475 480
Gln Glu Pro Thr Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser
485 490 495

Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 112
<211> 505
<212> PRT

<213> Human immunodeficiency virus

<400> 112

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Ile Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Ser Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Gly Ile Asn Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Pro Ala Ala Ala Asp Thr Gly Asn Thr Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ala
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Ala Ser Gly Leu Ala Ser Ala Ala Ile Met Met Gln Arg Gly Asn
370 375 380
Phe Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400
Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp
405 410 415
Lys Cys Gly Lys Asp Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln
420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly
435 440 445
Asn Phe Phe Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro
450 455 460
Glu Glu Ser Phe Arg Phe Gly Glu Glu Ala Thr Thr Pro Pro Gln Lys
465 470 475 480

Gln Glu Arg Lys Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser
485 490 495

Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 113

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 113

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Val Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Arg Ala Gln Gln Ala Ala Ala Ala Ala Asp Ser Gly Thr Asn Ser
115 120 125

Asn Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140

Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala
165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro
210 215 220

Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro
245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu
260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys
275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
290 295 300

Ile Leu Arg Ala Glu Gln Cys Ser Gln Asp Val Lys Asn Trp Met Thr
305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365

Met Ser Gln Met Thr Asn Ser Thr Ala Ile Met Met Gln Arg Gly Asn
370 375 380

Phe Arg Asn Gln Arg Arg Ser Val Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400

Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp
405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Leu Trp Pro Ser His Lys Gly Arg Pro Gly
435 440 445
Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser
450 455 460
Phe Arg Phe Gly Glu Glu Thr Thr Thr Ser Ser Gln Lys Gln Glu Pro
465 470 475 480
Ile Asp Lys Glu Leu Tyr Pro Ser Ala Ser Leu Arg Ser Leu Phe Gly
485 490 495

Asn Asp Pro Ser Ser Gln
500

<210> 114
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<400> 114
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Ala Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Ala

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        115                 120                 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
    130                 135                 140
Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145                 150                 155                 160
Glu Lys Ser Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
                165                 170                 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Ser Val Gly
            180                 185                 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
        195                 200                 205
Ala Ala Glu Trp Asp Arg Ile His Pro Val His Ala Gly Pro Val Ala
    210                 215                 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225                 230                 235                 240

Ser Asn Leu Gln Glu Gln Ile Asn Trp Met Thr Ser Asn Pro Pro Ile
                245                 250                 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
            260                 265                 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
        275                 280                 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
    290                 295                 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305                 310                 315                 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
                325                 330                 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
            340                 345                 350
Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
        355                 360                 365
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Gln Ala Thr Gly Ser Ala Ala Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ser Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480
Lys Glu Leu Tyr Pro Ser Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 115
<211> 501
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (28)..(28)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (30)..(30)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (209)..(209)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (269)..(269)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
<222> (373)..(373)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (375)..(375)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (382)..(382)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (387)..(387)
<223> Xaa can be any naturally occurring amino acid
<400> 115

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Xaa Tyr Xaa Leu Lys
20 25 30
His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60
Gln Pro Ala Leu Lys Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Ala Val Ala Thr Leu Tyr Cys Val His Gln Asp Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Xaa Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Xaa Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Asp Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ser His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Xaa Ala Xaa Ile Met Ile Gln Arg Gly Xaa Phe Arg
370 375 380

Asn Pro Xaa Lys Ser Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460

Phe Gly Glu Lys Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480
Lys Glu Glu Gln Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn
485 490 495
Asp Pro Ser Ser Gln
500

<210> 116
<211> 502
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (334)..(334)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature

<222> (376)..(376)
<223> Xaa can be any naturally occurring amino acid
<400> 116
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Gln Gly Gly Arg Lys Lys Tyr Lys Leu Lys
20 25 30
His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Tyr Ala Ile Asp Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Pro Thr Gly Ser Glu Glu Leu Arg Ser Leu His Asn
65 70 75 80

Ala Ile Ala Thr Leu Tyr Cys Val His Gln Asn Ile Asp Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Gly Thr Gly Asn Ser Ser Ser Ser

115 120 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met

130 135 140

Val His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala

165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn

195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro

210 215 220

Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro

245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Xaa Ile Leu

325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser His Met Thr Ser Gln Xaa Thr Ile Met Leu Gln Arg Gly Asn

370 375 380

Phe Lys Asn Pro Gly Arg Pro Val Lys Cys Phe Asn Cys Gly Lys Val

385 390 395 400

Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Asn Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser

450 455 460

Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro

465 470 475 480

Ile Asp Lys Asn Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln

500

<210> 117

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 117

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Val Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Lys Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Thr Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

His Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Ser Gln Arg Lys Met Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Asn Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Arg Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Gln Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 118

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 118

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Ser Tyr Gln Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Ser Ser Leu Lys Thr Gly Thr Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Ala Val Ala Val Leu Tyr Cys Val His Gln Gly Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Glu Ala Ala Asp Thr Gly Asn Asn Ser Asn

115 120 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met

130 135 140

Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala

165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Ile Leu Lys Glu Thr Ile Asn

195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro

210 215 220

Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Ser Asn Pro

245 250 255

Pro Ile Pro Val Gly Glu Val Tyr Lys Lys Trp Ile Ile Ile Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Ala Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Val Gln Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn

370 375 380

Pro Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu

385 390 395 400

Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser

450 455 460

Phe Arg Phe Gly Glu Glu Ala Thr Thr Pro Ser Gln Lys Gln Glu Gln

465 470 475 480

Lys Asp Lys Glu Val Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly

485 490 495

Asn Asp Pro Leu Ser Gln

500

<210> 119

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 119

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Asn Lys Arg Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Lys Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Glu Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Thr Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Ile Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro His Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255
Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Met Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Glu Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320
Leu Leu Ile Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Ser Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Thr Thr Asn Ala Ala Ala Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Ile Ala Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Gln Pro Thr Ala Pro Pro

450 455 460

Glu Glu Ser Ile Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys

465 470 475 480

Gln Glu Gln Lys Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser

485 490 495

Leu Phe Gly Asn Asp Gln

500

<210> 120

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 120

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Thr Ala Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Arg Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Arg Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Thr Thr Ala Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Leu Arg

450 455 460

Phe Gly Gly Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Leu Ser Gln

500

<210> 121

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 121

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Thr Lys Tyr Lys Leu Gln

20 25 30

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His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
        35                  40                  45
Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

    50                  55                  60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65                  70                  75                  80
Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
                85                  90                  95
Thr Lys Glu Ala Val Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
            100                 105                 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

        115                 120                 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
    130                 135                 140
Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145                 150                 155                 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
                165                 170                 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

            180                 185                 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
        195                 200                 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
    210                 215                 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225                 230                 235                 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

                245                 250                 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
            260                 265                 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
```

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Met Thr Asn Ser Ala Thr Ala Thr Ile Met Met Gln Lys Gly Asn

370 375 380

Phe Arg Asn Gln Arg Arg Thr Val Lys Cys Phe Asn Cys Gly Lys Glu

385 390 395 400

Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly

435 440 445

Asn Phe Ala Gln Gly Arg Leu Glu Pro Thr Ala Pro Pro Glu Glu Gly

450 455 460

Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro

465 470 475 480

Ile Asp Lys Asp Leu Tyr Pro Ser Val Ser Leu Arg Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln

500

<210> 122

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (85)..(85)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (391)..(391)

<223> Xaa can be any naturally occurring amino acid

<400> 122

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Lys Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Xaa Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Leu Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys His Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Thr Ser Ala Ile Leu Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Xaa Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Asn Arg Pro Glu Pro Ile Val Pro Thr Ala Pro Pro Glu Glu
450 455 460
Ser Phe Arg Phe Gly Glu Glu Thr Thr Pro Ser Arg Lys Pro Glu Gln
465 470 475 480

Gly Asp Lys Glu Met Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly
485 490 495
Asn Asp Pro Leu Ser Gln
500

<210> 123
<211> 499
<212> PRT
<213> Human immunodeficiency virus
<400> 123
Met Gly Ala Arg Ala Ser Ile Leu Arg Gly Gly Lys Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Lys Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Ile Ala Val Leu Tyr Cys Val His Gln Asn Ile Asp Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Arg Ile Glu Glu Glu Gln Asn Lys Cys Lys
100 105 110
Lys Lys Val Gln Gln Ala Ala Ala Asp Thr Gly Asn Asn Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Ile Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Ala Gln Ala Gly Pro Val Ala
210 215 220

Pro Asn Gln Val Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Ile Gly Leu Asn Thr
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Gly Ile Lys Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Arg Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Ser Ala Thr Val Met Met Gln Lys Asn Asn Phe Gly
370 375 380

Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Arg Gln Gly His
385 390 395 400
Ile Ala Lys Asn Cys Lys Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Ala Glu Ser Val Arg
450 455 460
Phe Gly Glu Glu Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp Glu
465 470 475 480

Glu Arg Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro
485 490 495
Ser Ser Gln

<210> 124
<211> 504
<212> PRT
<213> Human immunodeficiency virus
<400> 124
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80
Thr Ile Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly
115 120 125
Asn Arg Gly Gln Val Ser Gln Asn Phe Pro Ile Val Gln Asn Leu Gln
130 135 140
Gly Gln Met Val His Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp
145 150 155 160

Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met
165 170 175
Phe Thr Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met
180 185 190
Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu
195 200 205
Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His
210 215 220

Ala Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp
225 230 235 240
Ile Ala Gly Thr Thr Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr
245 250 255
His Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile
260 265 270
Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu
275 280 285

Asp Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg
290 295 300
Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn
305 310 315 320
Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys
325 330 335

Thr Ile Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met
340 345 350

Thr Ala Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu
355 360 365
Ala Glu Ala Met Ser Gln Val Asn Ser Ala Thr Val Met Met Gln Arg
370 375 380
Gly Asn Ile Arg Asn Gln Arg Lys Ala Val Lys Cys Phe Asn Cys Gly
385 390 395 400
Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly
405 410 415

Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu
420 425 430
Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg
435 440 445
Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu
450 455 460
Glu Ser Phe Arg Phe Gly Glu Arg Thr Thr Thr Pro Pro Gln Lys Gln
465 470 475 480

Glu Gln Ile Asp Lys Asp Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu
485 490 495
Phe Gly Asn Asp Pro Ser Ser Gln
500

<210> 125
<211> 506
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (41)..(41)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (223)..(223)
<223> Xaa can be any naturally occurring amino acid

<400> 125

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Gln Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Ser Lys Lys Tyr Arg Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Xaa Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Ser Lys Ser Lys

100 105 110

Lys Gly Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ala

165 170 175

Glu Gly Ala Thr Pro His Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Xaa Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

```
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile
                245                 250                 255
Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Met Gly Leu Asn Lys

            260                 265                 270
Val Val Lys Met Tyr Ser Pro Ile Ser Ile Leu Glu Ile Arg Gln Gly
        275                 280                 285
Pro Lys Glu Pro Phe Arg Glu Tyr Val Asp Arg Phe Tyr Lys Thr Leu
    290                 295                 300
Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305                 310                 315                 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

                325                 330                 335
Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Ser Ala Cys Gln Gly
            340                 345                 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
        355                 360                 365
Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg
    370                 375                 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385                 390                 395                 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
                405                 410                 415
Gly Arg Glu Gly His Gln Met Lys Asp Cys Ser Glu Arg Gln Ala Asn
            420                 425                 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
        435                 440                 445
Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Pro Thr Ala Pro

    450                 455                 460
Pro Ala Glu Ser Phe Arg Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln
465                 470                 475                 480
Lys Gln Glu Pro Lys Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg
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485 490 495

Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505

<210> 126

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (399)..(399)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (477)..(477)

<223> Xaa can be any naturally occurring amino acid

<400> 126

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ser Ala Ala Asp Thr Gly Asn Lys Gln Pro Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

```
Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145                 150                 155                 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

                165                 170                 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
            180                 185                 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
        195                 200                 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
    210                 215                 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225                 230                 235                 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile
                245                 250                 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
            260                 265                 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
        275                 280                 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

    290                 295                 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305                 310                 315                 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
                325                 330                 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
            340                 345                 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

        355                 360                 365
Gln Met Thr Asn Ser Asn Thr Val Met Met Gln Arg Gly Asn Phe Arg
    370                 375                 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Xaa His
```

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Arg Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Val Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Xaa Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 127

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (13)..(13)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (22)..(22)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (28)..(28)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (52)..(52)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (67)..(67)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (102)..(102)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (128)..(128)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (130)..(130)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (170)..(170)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (316)..(316)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (382)..(382)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (421)..(421)

<223> Xaa can be any naturally occurring amino acid

<400> 127

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Xaa Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Xaa Pro Gly Gly Lys Lys Xaa Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45

Gly Leu Leu Xaa Thr Ser Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Xaa Ile Lys Thr Gly Thr Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Val Ser Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Xaa Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Ala Asp Thr Gly Asn Xaa
115 120 125
Ser Xaa Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln
130 135 140

Met Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160
Val Val Glu Glu Lys Ala Phe Ser Pro Xaa Val Ile Pro Met Phe Ser
165 170 175
Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190
Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly
210 215 220
Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240
Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn
245 250 255
Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly
260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile
275 280 285
Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300
Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Xaa Lys Asn Trp Met
305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile
325 330 335

Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350
Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu
355 360 365
Ala Met Ser Gln Val Thr Asn Pro Thr Thr Ile Met Met Xaa Lys Gly
370 375 380
Asn Phe Arg Asn Gln Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Lys
385 390 395 400

Glu Gly His Ile Ser Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys
405 410 415
Trp Lys Cys Gly Xaa Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg
420 425 430
Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro
435 440 445
Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu
450 455 460

Ser Leu Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu
465 470 475 480
Pro Val Asp Lys Glu Leu Tyr Pro Phe Ser Ser Leu Arg Ser Leu Phe
485 490 495
Gly Asn Asp Pro Ser Ser Gln
500

<210> 128
<211> 501
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (13)..(13)
<223> Xaa can be any naturally occurring amino acid
<220><221

> misc_feature

<222> (122)..(122)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (168)..(168)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (190)..(190)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (248)..(248)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (251)..(251)

<223> Xaa can be any naturally occurring amino acid

<220

><221> misc_feature

<222> (309)..(309)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (337)..(337)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (390)..(390)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (404)..(404)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (443)..(443)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (469)..(469)

<223> Xaa can be any naturally occurring amino acid

<400> 128

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Xaa Asp Gln Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys
100 105 110

Lys Arg Val Gln Gln Ala Ala Ala Asp Xaa Gly Ser Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Xaa Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Xaa Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Val Xaa Trp Met Xaa Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
260 265 270
Val Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Xaa Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Xaa Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Ala Thr Asn Ser Ala Ala Ala Ile Met Met Gln Lys Gly Asn Phe
370 375 380
Lys Thr His Arg Lys Xaa Val Lys Cys Phe Asn Cys Gly Arg Glu Gly
385 390 395 400
His Ile Ala Xaa Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys
405 410 415
Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala
420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Xaa Gly Arg Pro Gly Asn
435 440 445
Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ile Phe
450 455 460
Arg Phe Gly Glu Xaa Thr Thr Thr Pro Thr Gln Lys Gln Glu Pro Ile
465 470 475 480
Asp Lys Glu Leu Ser Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn

485 490 495

Asp Pro Ser Ser Gln

500

<210> 129

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (107)..(107)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (307)..(307)

<223> Xaa can be any naturally occurring amino acid

<400> 129

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Tyr Ser Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Thr Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Val Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Arg Ile Glu Glu Xaa Gln Asn Lys Cys Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Asn Ser Gln Val

115 120 125

Ser Gln Asn Phe Pro Ile Val Gln Asn Ala Gln Gly Gln Met Val His

130 135 140

Gln Ser Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Val Ala Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Xaa Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ala Tyr Lys Ala Lys Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Thr Asn Ser Thr Asn Met Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Glu Cys Ser Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Ala Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Ser Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Leu Leu Gln

500

<210> 130

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (411)..(411)

<223> Xaa can be any naturally occurring amino acid

<400> 130

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Asp Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Lys Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Leu Lys Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Thr Ile Glu Lys Glu Gln Asn Lys Ser Lys
100 105 110
Ala Lys Glu Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Lys Val
115 120 125
Ser Gln Asn Phe Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Thr His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Arg Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Thr Ala Ile Met Met Gln Lys Gly Asn Phe Gly
370 375 380
Asn Gln Arg Lys Ser Ile Lys Cys Phe Asn Cys Gly Lys Val Gly His
385 390 395 400

Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Xaa Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460

Phe Gly Glu Glu Ile Ala Thr Pro Ser Gln Lys Gln Gly Gln Met Asp
465 470 475 480
Lys Glu Leu Tyr Pro Ser Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495
Pro Leu Ser Gln
500

<210> 131
<211> 505
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (126)..(126)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature

<222

> (398)..(398)

<223> Xaa can be any naturally occurring amino acid

<400> 131

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Gly Xaa Gln Ser

115 120 125

Ser Gly Asn Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln
130 135 140

Gly Gln Met Val His Gln Ala Ile Thr Pro Arg Thr Leu Asn Ala Trp
145 150 155 160

Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met
165 170 175

Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met

180 185 190

Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu
195 200 205

Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His
210 215 220

Ala Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp
225 230 235 240
Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr

245 250 255
Asn Asn Pro Pro Ile Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile
260 265 270
Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu
275 280 285
Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg
290 295 300
Phe Tyr Lys Thr Leu Arg Ala Glu Gln Thr Thr Gln Glu Val Lys Asn

305 310 315 320
Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys
325 330 335
Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met
340 345 350
Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu
355 360 365
Ala Glu Ala Met Ser Gln Val Thr Asn Ser Thr Ser Ile Met Met Gln

370 375 380
Arg Gly Asn Phe Lys Asn Gln Arg Arg Thr Val Lys Cys Xaa Asn Cys
385 390 395 400
Gly Lys Asp Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys
405 410 415
Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Asn
420 425 430
Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly

435 440 445
Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro
450 455 460
Glu Glu Ser Phe Ser Phe Gly Pro Glu Thr Thr Thr Pro Ser Gln Lys

465 470 475 480

Gln Glu Pro Ile Asp Gln Gly Val Tyr Pro Leu Thr Ser Leu Lys Ser

485 490 495

Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505

<210> 132

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (76)..(76)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (88)..(88)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (90)..(90)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (188)..(188)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (292)..(292)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (348)..(348)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (389)..(389)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (478)..(478)

<223> Xaa can be any naturally occurring amino acid

<400> 132

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Val Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Xaa Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Xaa His Xaa Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Thr Gln Gln Ala Ala Ala Asp Thr Arg Asn Asn Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Xaa Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Ile Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Thr Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Xaa Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Xaa Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Asn Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Pro Gln Arg Lys Xaa Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Ile Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Arg Glu Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Gly
450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Xaa Thr Asp
465 470 475 480
Lys Glu His Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe

485 490 495

Gly Asn Asp Pro Ser Ser Gln

500

<210> 133

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (76)..(76)

<223> Xaa can be any naturally occurring amino acid

<220><221

> misc_feature

<222> (486)..(486)

<223> Xaa can be any naturally occurring amino acid

<400> 133

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Leu

1 5 10 15

Glu Lys Ile Arg Leu Arg Ala Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Val Val Trp Ala Ser Arg Glu Leu Glu Gln Phe Ala Ile Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Xaa Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Lys Lys Leu Glu Ile Arg Asp

85 90 95

Thr Gln Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Gly Thr Gly Asn Ser Asn Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Met His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255
Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Met Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Ser Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380
Asn Gln Arg Arg Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Met Tyr Pro Xaa Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 134

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (18)..(18)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (127)..(127)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (189)..(189)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (215)..(215)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (283)..(283)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (361)..(361)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (449)..(449)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (451)..(451)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (481)..(481)

<223> Xaa can be any naturally occurring amino acid

<400> 134

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Xaa Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Ile Gln Leu

50 55 60

Gln Pro Ser Ile Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Asn Ile Glu Ile Arg Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asn Thr Gly Asn Ser Ser Xaa Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Pro Ile Ser Ala Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Xaa Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Ala Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Xaa His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Xaa Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Xaa Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Thr Asn Thr Ala Ala Ala Ile Met Met Gln Arg Gly Asn Phe

370 375 380

Arg Asn Gln Arg Lys Ser Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Gln Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn

435 440 445

Xaa Leu Xaa Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Leu

450 455 460

Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Glu

465 470 475 480

Xaa Lys Gly Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 135

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (56)..(56)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (102)..(102)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (138)..(138)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (147)..(147)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (159)..(159)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (252)..(252)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (286)..(286)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (322)..(322)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (331)..(331)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (385)..(385)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (460)..(460)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (470)..(470)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (479)..(479)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (483)..(483)

<223> Xaa can be any naturally occurring amino acid

<400> 135

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Lys Xaa Cys Ser Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Xaa Lys Val Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Arg Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Xaa Gln Gly Gln Met Val His

130 135 140

Gln Pro Xaa Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Xaa Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Asp Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Xaa Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Xaa Gln Gly

275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Xaa Val Gln Asn Ala Asn Pro Asp Cys Xaa Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Thr Val Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Xaa Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Xaa Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Xaa Thr Pro Ser Gln Lys Gln Glu Thr Xaa Asp

465 470 475 480
Lys Glu Xaa Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln

500

<210> 136

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (28)..(28)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (52)..(52)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (66)..(66)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (84)..(84)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (105)..(105)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (118)..(118)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (188)..(188)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (219)..(219)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (415)..(415)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (485)..(485)

<223> Xaa can be any naturally occurring amino acid

<400> 136

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Xaa Tyr Gln Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Xaa Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Xaa Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Xaa Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Val Xaa Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Gln Ala Gln Gln Xaa Ala Ala Asp Thr Ala Lys Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Xaa Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Xaa Ala Gly Pro Val Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Ala Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Lys
370 375 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Xaa Cys

405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro Glu Glu
450 455 460
Ser Phe Arg Phe Gly Glu Glu Thr Ile Thr Pro Pro Gln Arg Gln Glu

465 470 475 480

Pro Thr Asp Lys Xaa Met Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe

485 490 495

Gly Ser Asp Pro

500

<210> 137

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (182)..(182)

<223> Xaa can be any naturally occurring amino acid

<400> 137

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Pro Ala Ala Ala Ala Ala Ala Gly Asn Asp Asn Gln

115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val

130 135 140

His Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile

145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu

165 170 175

Ser Glu Gly Ala Thr Xaa Gln Asp Leu Asn Thr Met Leu Asn Thr Val

180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu

195 200 205

Glu Ala Ala Glu Trp Asp Arg Leu His Pro Pro Gln Ala Gly Pro Val

210 215 220

Ala Pro Gly Gln Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr

225 230 235 240

Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro

245 250 255

Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Ile Ser Ile Leu Asp Ile Arg Gln

275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys

325 330 335

Ala Leu Gly Pro Gly Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Ser Gln Ala Thr Asn Thr Ala Thr Ile Met Met Gln Lys Gly Asn Phe

370 375 380

Lys Asn Gln Arg Lys Met Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys
405 410 415
Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala
420 425 430
Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn
435 440 445
Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe
450 455 460

Arg Phe Gly Glu Glu Ala Ala Ala Pro Pro Gln Lys Gln Glu Pro Thr
465 470 475 480
Asp Lys Glu Met Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn
485 490 495
Asp Pro Ser Ser Gln
500

<210> 138
<211> 502
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (260)..(260)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature

<222> (286)..(286)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (409)..(409)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (449)..(449)
<223> Xaa can be any naturally occurring amino acid
<400> 138
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Met Val Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Ile
115 120 125
Ser Gln Asn Phe Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Xaa Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Xaa Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Asp Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Asn Ser Ala Ala Ile Met Met Gln Lys Gly Asn Phe Lys Asn

370 375 380

Gln Arg Arg Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Val

385 390 395 400

Ala Lys Asn Cys Arg Ala Pro Arg Xaa Lys Gly Cys Trp Lys Cys Gly

405 410 415

Gln Glu Gly His Gln Met Lys Asp Cys Thr Ala Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Xaa Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro Glu Glu Ser

450 455 460

Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro

465 470 475 480

Thr Asp Lys Ser Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln

500

<210> 139

<211> 498

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

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<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (139)..(139)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (164)..(164)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (390)..(390)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (392)..(392)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (408)..(408)

<223> Xaa can be any naturally occurring amino acid

<400> 139

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Asn Leu Lys
20 25 30

His Val Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Arg Thr Gly Ser Glu Glu Leu Xaa Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Arg Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Thr Asp Thr Gly Ser Lys Glu Gln Ile
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Xaa Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Xaa Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ala Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Ser Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser
355 360 365
Gln Ala Thr Ser Ala Ala Ile Met Met Gln Arg Gly Asn Phe Arg Asp
370 375 380
Lys Arg Lys Thr Val Xaa Cys Xaa Asn Cys Gly Arg Glu Gly His Ile
385 390 395 400

Ala Lys Asn Cys Arg Ala Pro Xaa Lys Lys Gly Cys Trp Lys Cys Gly
405 410 415
Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala Asn Phe
420 425 430
Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu
435 440 445
Gln Ser Lys Val Glu Pro Thr Ala Pro Pro Glu Glu Ser Ile Arg Phe
450 455 460

Gly Glu Glu Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp Lys Glu
465 470 475 480
Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Ser
485 490 495
Ser Gln

<210> 140
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
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<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature

<222> (24)..(24)

<

223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (53)..(53)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (103)..(103)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (113)..(113)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (136)..(136)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (145)..(145)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (164)..(164)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (167)..(167)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (235)..(235)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (249)..(249)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (313)..(313)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (380)..(380)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (463)..(463)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (465)..(465)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (479)..(479)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (486)..(486)

<223> Xaa can be any naturally occurring amino acid

<400> 140

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Xaa Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Xaa Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Xaa Ser Glu Gly Cys Arg Lys Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Xaa Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Xaa Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Ser Gln
115 120 125

Val Ser Gln Asn Tyr Pro Ile Xaa Gln Asn Ile Gln Gly Gln Met Val
130 135 140
Xaa Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile
145 150 155 160
Glu Glu Lys Xaa Phe Ser Xaa Glu Val Ile Pro Met Phe Ser Ala Leu
165 170 175
Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val

180 185 190
Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu
195 200 205
Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile
210 215 220
Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Xaa Asp Ile Ala Gly Thr
225 230 235 240
Thr Ser Thr Leu Gln Glu Gln Ile Xaa Trp Met Thr His Asn Pro Pro

245 250 255
Ile Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn
260 265 270
Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln
275 280 285
Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr
290 295 300
Leu Arg Ala Glu Gln Ala Ser Gln Xaa Val Lys Asn Trp Met Thr Glu

305 310 315 320
Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys
325 330 335
Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln
340 345 350
Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met
355 360 365
Ser Gln Thr Asn Ser Ala Thr Ile Met Met Gln Xaa Gly Asn Phe Arg

370 375 380

Asn Pro Lys Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Ser Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Arg Leu Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Xaa Ser

450 455 460

Xaa Arg Glu Glu Ile Thr Thr Pro Pro Gln Lys Gln Glu Pro Xaa Asp

465 470 475 480

Lys Thr Met Tyr Pro Xaa Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 141

<211> 505

<212> PRT

<213> Human immunodeficiency virus

<400> 141

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Ser Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Ala Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Val Gln Gln Gln Gln Ala Ala Ala Ala Ala Gly Ser Ser Ser

115 120 125
Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140
Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160
Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala
165 170 175
Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr

180 185 190
Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205
Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro
210 215 220
Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240
Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro

245 250 255
Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu
260 265 270
Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys
275 280 285
Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
290 295 300
Thr Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr

305 310 315 320
Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Val Thr Asn Pro Ala Thr Val Met Met Gln Arg Gly Asn

370 375 380

Phe Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu

385 390 395 400

Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro

450 455 460

Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Ala Ala Pro Ser Gln Lys

465 470 475 480

Gln Glu Pro Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser

485 490 495

Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505

<210> 142

<211> 510

<212> PRT

<213> Human immunodeficiency virus

<400> 142

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Gly Thr Asn

115 120 125
Thr Gly Asn Ser Gly Thr Val Ser Gln Asn Tyr Pro Ile Val Gln Asn
130 135 140
Leu Gln Gly Gln Met Val His Gln Pro Leu Ser Pro Arg Thr Leu Asn
145 150 155 160
Ala Trp Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile
165 170 175
Pro Met Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn

180 185 190
Thr Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu
195 200 205
Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro
210 215 220
Val His Ala Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly
225 230 235 240
Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp

245 250 255
Met Thr His Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp
260 265 270
Ile Ile Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser

275 280 285

Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val

290 295 300

Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val

305 310 315 320

Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp

325 330 335

Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu

340 345 350

Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg

355 360 365

Val Leu Ala Glu Ala Met Ser Gln Met Thr Asn Pro Ala Ser Ile Met

370 375 380

Met Gln Arg Gly Asn Tyr Arg Asn Gln Arg Lys Thr Val Lys Cys Phe

385 390 395 400

Asn Cys Gly Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg

405 410 415

Lys Lys Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp

420 425 430

Cys Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His

435 440 445

Lys Gly Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala

450 455 460

Pro Pro Ala Pro Pro Glu Glu Ser Phe Met Phe Gly Glu Glu Thr Thr

465 470 475 480

Thr Pro Pro Gln Lys Gln Glu Ser Ile Asp Lys Gly Gly Tyr Pro Leu

485 490 495

Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505 510

<210> 143

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 143

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Asn Lys Arg Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Gly Gly Cys Arg Gln Ile Leu Ala Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Pro Ala Ala Ala Asp Ala Gly Thr Ser Ser Gln Ala
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Gly Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Lys
370 375 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp
465 470 475 480

Lys Glu Val Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 144

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (46)..(46)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (264)..(264)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (422)..(422)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (479)..(479)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (481)..(481)

<223> Xaa can be any naturally occurring amino acid

<400> 144

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Xaa Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Arg Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Pro Gln Thr Ala Ala Ala Ala Ala Asp Ala Gly Ser Asn
115 120 125
Ser Lys Val Ser Leu Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln
130 135 140
Met Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160
Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser
165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190
Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205
Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly
210 215 220
Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240

Gly Thr Thr Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn
245 250 255
Pro Pro Ile Pro Val Gly Glu Xaa Tyr Lys Arg Trp Ile Ile Leu Gly
260 265 270
Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile
275 280 285
Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met

305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile

325 330 335

Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala

340 345 350

Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu

355 360 365

Ala Met Ser Gln Met Thr Asn Ser Ala Thr Val Met Met Gln Arg Gly

370 375 380

Asn Phe Lys Gly Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys

385 390 395 400

Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys

405 410 415

Trp Lys Cys Gly Lys Xaa Gly His Gln Met Lys Asp Cys Asp Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser

450 455 460

Phe Arg Phe Gly Glu Glu Thr Thr Pro Pro Gln Lys Gln Glu Xaa Thr

465 470 475 480

Xaa Arg Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe

485 490 495

Gly Asn Asp Pro Ser Ser Gln

500

<210> 145

<211> 494

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (41)..(41)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (44)..(44)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (180)..(180)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (258)..(258)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (301)..(301)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (307)..(307)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (316)..(316)

<223> Xaa can be any naturally occurring amino acid

<400> 145

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Xaa Glu Arg Xaa Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Val Glu Glu Glu Gln Asp Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Ser Ser Gln Val Ser Gln Asn

115 120 125

Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His Gln Ala Ile

130 135 140

Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys Ala

145 150 155 160

Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu Ser Glu Gly Ala

165 170 175

Thr Pro Gln Xaa Leu Asn Thr Met Leu Asn Thr Val Gly Gly His Gln

180 185 190

Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu

195 200 205

Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala Pro Gly Gln

210 215 220

Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu

225 230 235 240

Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Thr Pro Val Gly

245 250 255

Glu Xaa Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg

260 265 270

Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu

275 280 285

Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Xaa Arg Ala Glu

290 295 300

Gln Ala Xaa Gln Glu Val Lys Asn Trp Met Thr Xaa Thr Leu Leu Val

305 310 315 320

Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro

325 330 335

Gly Ala Thr Leu Glu Asp Met Met Thr Ala Cys Gln Gly Val Gly Gly

340 345 350

Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Val Asn
355 360 365
Pro Ala Thr Ile Met Val Gln Arg Gly Asn Phe Arg Asn Gln Arg Lys
370 375 380
Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Val Ala Arg Asn
385 390 395 400
Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Lys Glu Gly

405 410 415
His Gln Met Lys Asp Cys Thr Glu Arg Gln Val Asn Phe Leu Gly Lys
420 425 430
Ile Trp Pro Ser His Lys Glu Arg Pro Gly Asn Phe Phe Gln Ser Arg
435 440 445
Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg Glu Glu Thr Thr
450 455 460
Thr Pro Ser Gln Lys Gln Glu Pro Lys Asp Lys Glu Leu Tyr Pro Leu

465 470 475 480
Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
485 490

<210> 146
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<400> 146
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Gly Glu Gly Cys Arg Gln Ile Leu Ala Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Ala Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Arg Ser Lys

100 105 110

Arg Lys Val Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Thr Ile

115 120 125

Ser Gln Asn Phe Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ser Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Met Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Ser Pro Ala Asn Ile Met Met Gln Arg Gly Asn Phe Lys
370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Asp Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Val Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Leu Glu Pro Thr Ala Pro Pro Glu Glu Ser Val Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480

Lys Glu Leu Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln
500

<210> 147
<211> 504
<212> PRT
<213> Human immunodeficiency virus
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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

<400> 147

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Arg Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Xaa His Gln Xaa Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Arg Ile Glu Glu Glu Gln Asn Xaa Cys Lys
100 105 110

Lys Lys Ala Gln Gln Ala Xaa Ala Asp Thr Gly Asn Ser Asn Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Xaa Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Xaa His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Gly

370 375 380

Asn Gln Lys Arg Lys Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Arg Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Ile Glu Arg Gln Val Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Glu Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro Glu

450 455 460

Glu Ser Phe Arg Phe Gly Glu Gly Thr Thr Thr Pro Ser Gln Lys Gln

465 470 475 480

Glu Xaa Thr Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu

485 490 495

Phe Gly Asn Asp Pro Leu Leu Gln

500

<210> 148

<211> 500

<212> PRT

<213> Human immunodeficiency virus

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

<400> 148

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Ser
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Xaa Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Xaa Asn
65 70 75 80

Thr Xaa Ala Thr Leu Tyr Cys Val His Gln Gly Ile Asp Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Xaa Lys
100 105 110
Lys Lys Ala Lys Gln Ala Glu Ala Asp Ala Gly Asn Asn Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ala Gln Gly Gln Met Xaa His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Xaa Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Xaa His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Xaa Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
260 265 270
Ile Val Xaa Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Xaa Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Xaa Ala Thr Leu Glu Glu Met Met Thr Ala Xaa Gln Gly

340 345 350

Val Gly Gly Pro Ala His Lys Ala Arg Val Leu Ala Glu Ala Met Gly

355 360 365

Gln Val Thr Asn Ser Asn Ile Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Xaa Thr Val Lys Cys Phe Asn Cys Gly Arg Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Lys Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Xaa Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Xaa Arg Pro Xaa Asn Xaa

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Ala Thr Pro Xaa Gln Lys Gln Xaa Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Xaa Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Xaa

500

<210> 149

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<220

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

<400> 149

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Xaa Arg Pro Xaa Gly Lys Lys Thr Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Asp Xaa Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Gln Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Gln Ile Glu Glu Glu Gln Asn Arg Cys Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Val Ser Gln Asn Tyr Pro Ile Xaa Gln Asn Met Gln Gly Gln
130 135 140

Met Val His Gln Xaa Ile Ser Pro Arg Thr Leu Asn Xaa Trp Val Lys
145 150 155 160
Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr

165 170 175
Ala Leu Ser Glu Gly Ala Xaa Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190
Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile
195 200 205
Asn Glu Glu Xaa Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly
210 215 220
Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala

225 230 235 240
Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn
245 250 255
Pro Pro Met Pro Val Gly Xaa Ile Tyr Lys Arg Trp Ile Ile Leu Gly
260 265 270
Leu Asn Lys Ile Val Arg Met Tyr Ser Xaa Thr Ser Ile Xaa Asp Ile
275 280 285
Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr

290 295 300
Lys Thr Leu Arg Ala Glu Gln Ala Ser Ala Asp Val Lys Gly Trp Met
305 310 315 320
Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile
325 330 335
Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350
Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu

355 360 365
Ala Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly
370 375 380
Asn Phe Arg Xaa Gln Arg Lys Xaa Val Lys Cys Phe Asn Cys Gly Lys

385 390 395 400

Xaa Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys

405 410 415

Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg

420 425 430

Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Xaa Arg Pro

435 440 445

Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Xaa Glu Glu

450 455 460

Ser Phe Arg Phe Gly Glu Glu Xaa Ala Thr Pro Ser Gln Lys Gln Glu

465 470 475 480

Pro Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe

485 490 495

Gly Asn Asp His Ser Ser Gln

500

<210> 150

<211> 500

<212> PRT

<213> Human immunodeficiency virus

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<223> Xaa can be any naturally occurring amino acid

<400> 150

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Xaa Leu Asp Gln Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Xaa Leu

50 55 60

Xaa Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Xaa Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Xaa His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Xaa Ala Gln Gln Ala Ala Ala Asp Thr Glu Lys Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Xaa Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Xaa Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Val Ala Trp Met Thr Ala Asn Pro Ala Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Xaa Tyr Val Asp Arg Phe Tyr Arg Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Xaa Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Ala Gln Thr Pro Asn Ser Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380

Asn Xaa Arg Lys Asn Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Asn Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Xaa Glu Ser Phe Arg
450 455 460

Xaa Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp
465 470 475 480

Lys Glu Gln Tyr Pro Leu Xaa Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Thr
500

<210> 151

<211> 503

<212> PRT

<213> Human immunodeficiency virus

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<400> 151

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Asp Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Xaa Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Lys Val Ala Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Leu Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Thr Gln Gln Ala Ala Ala Ala Ala Thr Gly Thr Gly Asn Ser
115 120 125
Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln
130 135 140
Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160
Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser
165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190
Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205
Asn Glu Glu Ala Ala Glu Trp Asp Arg Val His Xaa Val His Ala Gly
210 215 220
Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240

Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn
245 250 255
Xaa Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly
260 265 270
Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile
275 280 285
Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met
305 310 315 320
Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile
325 330 335
Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350

Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu
355 360 365

Ala Met Ser Gln Val Thr Asn Ser Ala Ser Ile Met Met Gln Arg Gly
370 375 380
Asn Phe Arg Asn Gln Arg Lys Ala Val Lys Cys Phe Asn Cys Gly Lys
385 390 395 400
Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys
405 410 415
Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg
420 425 430

Gln Ala Asn Phe Leu Gly Lys Ile Trp Xaa Ser His Lys Gly Arg Pro
435 440 445
Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu
450 455 460
Xaa Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu
465 470 475 480
Pro Ile Asp Arg Glu Val Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe
485 490 495

Gly Asn Asp Pro Ser Ser Gln
500

<210> 152
<211> 500
<212> PRT
<213> Human immunodeficiency virus
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<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (191)..(191)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (219)..(219)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (246)..(246)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (256)..(256)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (363)..(363)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (393)..(393)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (443)..(443)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (467)..(467)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (470)..(470)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (486)..(486)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (490)..(490)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
<222> (500)..(500)
<223> Xaa can be any naturally occurring amino acid
<400> 152

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15
Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Xaa Thr Tyr Gln Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
His Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Xaa Tyr Asn
65 70 75 80
Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Arg Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Pro Ala Ala Ala Asp Thr Xaa Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His
130 135 140
Gln Ser Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Xaa Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Xaa Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Xaa Ile Gly Trp Met Thr Ser Asn Pro Pro Xaa
245 250 255
Gln Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Xaa Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Thr Ala Thr Ile Met Ala Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Xaa Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Xaa Arg Pro Gly Asn Phe
435 440 445
Leu Gln Asn Arg Pro Glu Pro Ser Ala Pro Pro Ala Glu Ser Phe Lys

450 455 460

Phe Gly Xaa Glu Thr Xaa Thr Pro Pro Gln Lys Gln Asp Pro Ile Asp
465 470 475 480

Lys Glu Leu Tyr Pro Xaa Ala Ser Leu Xaa Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Xaa
500

<210> 153

<211> 508

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (97)..(97)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (186)..(186)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (310)..(310)

<223> Xaa can be any naturally occurring amino acid

<400> 153

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp

85 90 95

Xaa Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Asn Ser Ser Gln

115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val

130 135 140

His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val

145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu

165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Xaa Thr Met Leu Asn Thr Val

180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu

195 200 205

Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile

210 215 220

Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr

225 230 235 240

Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro

245 250 255

Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln

275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Xaa Ser Gln Glu Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys

325 330 335

Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln
340 345 350

Gly Val Gly Gly Pro Ser His Lys Ala Lys Ile Met Ala Glu Ala Met
355 360 365

Ser Gln Ile Thr Asn Ser Ala Ala Ile Met Met Gln Lys Gly Asn Phe
370 375 380

Arg Asn Gln Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Lys Glu Gly
385 390 395 400

His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys
405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala
420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn
435 440 445

Phe Leu Gln Asn Arg Pro Asp Pro Pro Ala Pro Arg Pro Glu Pro Ser
450 455 460

Ala Pro Pro Met Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro
465 470 475 480

Ser Gln Lys Lys Glu Glu Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser
485 490 495

Leu Lys Ser Leu Phe Gly Asn Asp Pro Leu Ser Gln
500 505

<210> 154

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (254)..(254)

<223> Xaa can be any naturally occurring amino acid

<400> 154

Met Gly Ala Arg Ala Ser Val Leu Ser Ala Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Arg Leu Lys
20 25 30
His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Thr Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Ile Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95
Thr Met Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Arg Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Thr Glu Asn Ser Ser Gln Gly Gln
115 120 125

Gly Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val
130 135 140
His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val
145 150 155 160
Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu
165 170 175
Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu
195 200 205
Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Ile
210 215 220
Ala Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
225 230 235 240
Thr Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Xaa Pro Pro
245 250 255

Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln

275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys

325 330 335

Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Ser Gln Val Thr Asn Ser Ala Thr Thr Met Met Gln Arg Gly Asn Phe

370 375 380

Arg Asn Pro Arg Lys Asn Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe

450 455 460

Arg Phe Gly Glu Glu Ala Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Ser Asp

485 490 495

Pro Ser Ser Gln

500

<210> 155

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<220

><221> misc_feature

<222> (27)..(27)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (30)..(30)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (41)..(41)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (63)..(63)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (65)..(65)

<223> Xaa can be any naturally occurring amino acid

<220><221

> misc_feature

<222> (69)..(69)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (79)..(79)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (126)..(126)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (136)..(136)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (138)..(138)

<223> Xaa can be any naturally occurring amino acid

<220><

221> misc_feature

<222> (197)..(197)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (233)..(233)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (268)..(268)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (278)..(278)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (306)..(306)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (322)..(322)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (361)..(361)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (407)..(407)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (449)..(449)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (452)..(452)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (476)..(476)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (486)..(486)

<223> Xaa can be any naturally occurring amino acid

<400> 155

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Xaa Gln Tyr Xaa Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Xaa Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Gly Glu Gly Cys Lys Gln Ile Leu Glu Xaa Leu
50 55 60

Xaa Pro Ala Leu Xaa Thr Gly Ser Glu Glu Leu Lys Ser Leu Xaa Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Ala Gly Asn Asn Xaa Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Xaa Asn Xaa Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Xaa Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Ile Arg Glu Pro Arg Xaa Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Xaa Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Xaa Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Xaa Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Xaa Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Xaa Ile Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Xaa Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe

435 440 445

Xaa Gln Ser Xaa Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Pro Pro Gln Lys Gln Xaa Gln Ile Asp Lys
465 470 475 480
Glu Leu Tyr Pro Ser Xaa Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro

485 490 495
Ser Ser Gln

<210> 156
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (375)..(375)
<223> Xaa can be any naturally occurring amino acid
<400> 156
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Thr Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Leu Ala Val Leu Tyr Cys Val His Gln Asn Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Gln Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Thr Ala Asn Thr Gly Asn Ser Asn Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Met His Pro Val His Ala Gly Pro Asn Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Ser Ala Xaa Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380

Asn Gln Arg Arg Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Pro Glu Gln Ala Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Val Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 157

<211> 507

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (317)..(317)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (386)..(386)

<223> Xaa can be any naturally occurring amino acid

<400> 157

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asn Thr Gly Asn Ser Ser Gln Gly

115 120 125

Ser Gln Ser Gly Ser Gln Gly Ser Gln Asn Tyr Pro Ile Val Gln Asn

130 135 140

Ile Gln Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn

145 150 155 160

Ala Trp Val Lys Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile

165 170 175

Pro Met Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn

180 185 190

Thr Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu

195 200 205

Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro

210 215 220

Val Pro Ala Gly Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly

225 230 235 240

Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp

245 250 255

Met Thr Asn Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp

260 265 270

Ile Ile Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser

275 280 285

Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val

290 295 300

Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Xaa Gln Glu Val

305 310 315 320

Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp

325 330 335

Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu

340 345 350

Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg

355 360 365

Val Leu Ala Glu Ala Met Ser Gln Val Thr Asn Pro Thr Thr Ile Met

370 375 380

Met Xaa Arg Gly Asn Phe Arg Asn Gln Arg Lys Thr Ile Lys Cys Phe

385 390 395 400

Asn Cys Gly Lys Glu Gly His Leu Ala Arg Asn Cys Arg Ala Pro Arg

405 410 415

Lys Lys Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp

420 425 430

Cys Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His

435 440 445

Lys Gly Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala

450 455 460

Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser

465 470 475 480

Gln Lys Gln Glu Thr Ile Asp Lys Glu Met Tyr Pro Ile Thr Ser Leu

485 490 495

Lys Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505

<210> 158

<211> 504

<212> PRT

<213> Human immunodeficiency virus

<400> 158

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30
His Val Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Glu Ala Asp Thr Gly Asn Arg Asn Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Pro Thr Ala Ile Met Ile Gln Lys Gly Asn Phe Arg
370 375 380

Asn Gln Arg Arg Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Asn Arg Pro Glu Asn Arg Pro Glu Pro Thr Ala Pro Pro Ala
450 455 460
Glu Ser Phe Arg Phe Gly Glu Glu Thr Met Ala Pro Ser Gln Lys Gln
465 470 475 480
Glu Pro Thr Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu

485 490 495

Phe Gly Asn Asp Pro Ser Ser Gln

500

<210> 159

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (161)..(161)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (264)..(264)

<223> Xaa can be any naturally occurring amino acid

<400> 159

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Glu Lys Leu Gly Asn Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Ser Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Asn Ile Glu Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Gly Thr Gly Asn Ser Ser Gln Ala

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His

130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Xaa Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser

165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Xaa Trp Ile Val Met Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Val Leu

290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365
Gln Val Thr His Pro Thr Thr Ile Met Met Gln Lys Gly Asn Phe Gly
370 375 380
Asn Gln Arg Lys Met Val Lys Cys Phe Asn Cys Gly Lys Ala Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Asn Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 160

<211> 498

<212> PRT

<213> Human immunodeficiency virus

<400> 160

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Gln Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Ser Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser Ser

115 120 125

Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His Gln

130 135 140

Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu

145 150 155 160

Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu

165 170 175

Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly

180 185 190

His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala

195 200 205

Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala Pro

210 215 220

Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser

225 230 235 240

Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile Pro

245 250 255

Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile

260 265 270

Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly Pro

275 280 285

Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Ile Leu Arg

290 295 300

Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Ala Glu Thr Leu

305 310 315 320

Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu

325 330 335

Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val

340 345 350

Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln

355 360 365

Val Ala Asn Pro Pro Thr Ile Met Ile Gln Lys Gly Asn Phe Arg Asn

370 375 380

Gln Arg Lys Ile Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His Leu

385 390 395 400

Ala Arg Asn Cys Lys Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys Gly

405 410 415

Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe

450 455 460

Gly Glu Glu Thr Thr Thr Pro Gln Lys Gln Glu Pro Ile Asp Lys Glu

465 470 475 480

Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser

485 490 495

Ser Thr

<210> 161

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 161

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Met Gly Arg Lys Lys Tyr Lys Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Asp Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Arg Gln Leu
50 55 60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Gly Ile Glu Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Glu Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Lys Asn Ser Thr Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His
130 135 140
Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Ser Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Ser Ala Ser Ile Met Met Gln Arg Gly Asn Phe Lys
370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480
Lys Glu Arg Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 162
<211> 510
<212> PRT

<213> Human immunodeficiency virus

<400> 162

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Val Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Gly Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser His Thr
115 120 125

Gly Asn Ser Gly Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu
130 135 140

Gln Gly Gln Met Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala
145 150 155 160

Trp Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro
165 170 175

Met Phe Thr Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr
180 185 190

Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys
195 200 205

Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val
210 215 220

His Ala Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser

225 230 235 240

Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met
245 250 255
Thr His Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile
260 265 270
Ile Met Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile
275 280 285
Leu Asp Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp
290 295 300

Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys
305 310 315 320
Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys
325 330 335
Lys Thr Ile Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met
340 345 350
Met Thr Ala Cys Gln Gly Val Gly Gly Pro Ala His Lys Ala Arg Val
355 360 365

Leu Ala Glu Ala Met Ser Gln Val Thr Asn Ser Ala Thr Val Met Met
370 375 380
Gln Lys Gly Asn Phe Arg Asn Gln Arg Lys Thr Ile Lys Cys Phe Asn
385 390 395 400
Cys Gly Lys Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys
405 410 415
Arg Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys
420 425 430

Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys
435 440 445
Gly Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Ser Arg Pro Glu
450 455 460
Pro Thr Ala Pro Pro Glu Glu Cys Phe Arg Phe Gly Glu Glu Thr Thr
465 470 475 480

Ala Pro Pro Gln Lys Gln Glu Pro Ile Asp Lys Glu Leu Tyr Pro Leu
485 490 495

Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505 510

<210> 163

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<400> 163

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Thr Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Gly Ile Glu Ile Lys Asp
85 90 95

Thr Arg Glu Ala Leu Asp Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Val Gln Gln Thr Ala Asp Gly Thr Gly Asn Ser Ser Gln Ala
115 120 125

Ser Gln Asn Tyr Pro Ile Val Arg Asn Leu Gln Gly Gln Leu Thr His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Asp Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365
Gln Val Thr Gly Ser Ala Thr Ile Met Met Gln Lys Gly Asn Ile Arg
370 375 380
Ser Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro Glu Glu

450 455 460

Ser Phe Arg Phe Gly Glu Glu Thr Thr Ala Pro Ser Gln Lys Gln Glu

465 470 475 480

Pro Ile Asn Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe

485 490 495

Gly Asn Asp Pro Ser Ser Gln

500

<210> 164

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<400> 164

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Thr Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Gln Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Pro Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Gly Lys

100 105 110

Lys Gln Ala Gln Gln Ala Ala Ala Asp Thr Gly Ser Ser Ser Lys Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His

130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Asp Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Ala Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Pro Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Asn Lys Gly Arg Pro Gly Asn Phe

435 440 445

Pro Gln Gly Arg Leu Thr Pro Thr Ala Pro Pro Ala Pro Pro Glu Glu

450 455 460

Ser Phe Arg Phe Gly Glu Glu Thr Thr Asn Pro Ser Gln Arg Gln Glu

465 470 475 480

Pro Ile Asp Gln Glu Arg Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe

485 490 495

Gly Asn Asp Pro Ser Ser Gln

500

<210> 165

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<400> 165

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Ser Ser Leu Pro Thr Ala Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Asn Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110
Lys Lys Ala Gln Pro Ala Thr Ala Ala Asp Thr Gly Ser Ser Ser Thr
115 120 125
Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val
130 135 140
His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val
145 150 155 160
Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu

165 170 175
Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190
Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu
195 200 205
Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile
210 215 220
Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr

225 230 235 240
Thr Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro
245 250 255
Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn
260 265 270
Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln
275 280 285
Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300
Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu
305 310 315 320
Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys

325 330 335

Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Ser Gln Val Thr Gly Ser Ala Asn Val Met Met Gln Arg Gly Asn Phe

370 375 380

Lys Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Arg Glu Gly

385 390 395 400

His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe

450 455 460

Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile

465 470 475 480

Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn

485 490 495

Asp Pro Ser Ser Gln

500

<210> 166

<211> 508

<212> PRT

<213> Human immunodeficiency virus

<400> 166

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Val Leu Phe Cys Val Gln Arg Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Gln Gln Ala Ala Ala Asp Thr Arg

115 120 125

Asn Ser Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln

130 135 140

Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp

145 150 155 160

Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met

165 170 175

Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met

180 185 190

Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu

195 200 205

Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His

210 215 220

Ala Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp

225 230 235 240

Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr

245 250 255

Asn Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile

260 265 270

Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu

275 280 285

Asp Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg

290 295 300

Phe Tyr Lys Ile Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn

305 310 315 320

Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys

325 330 335

Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met

340 345 350

Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu

355 360 365

Ala Glu Ala Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln

370 375 380

Arg Gly Asn Phe Lys Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys

385 390 395 400

Gly Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys

405 410 415

Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asn Cys Thr

420 425 430

Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly

435 440 445

Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro

450 455 460

Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Ala Thr Pro

465 470 475 480

Pro Gln Arg Gln Glu Gln Arg Asp Glu Glu Lys Tyr Pro Leu Thr Ser

485 490 495

Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505

<210> 167

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<400> 167

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Lys Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Ala Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Asn Ile Glu Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Ala Ala Gln Gln Ala Ala Ala Gly Thr Gly Asp Ser
115 120 125

Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln
130 135 140

Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160

Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser
165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Ala Gln Ala Gly
210 215 220

Pro Ile Ala Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240
Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Thr Trp Met Thr Asn Asn
245 250 255
Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly
260 265 270
Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile
275 280 285

Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300
Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met
305 310 315 320
Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile
325 330 335
Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350

Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu
355 360 365
Ala Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly
370 375 380
Asn Phe Arg Ser Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys
385 390 395 400
Glu Gly His Thr Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys
405 410 415

Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg
420 425 430
Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro
435 440 445
Gly Asn Phe Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu
450 455 460
Ser Phe Arg Phe Gly Glu Glu Thr Thr Ala Thr Pro Pro Gln Lys Gln

465 470 475 480

Glu Pro Ile Asp Arg Glu Val Tyr Pro Leu Thr Ser Leu Arg Ser Leu
485 490 495

Phe Gly Asn Asp Pro Ser Ser
500

<210> 168

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<400> 168

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Arg Lys Gln Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Leu Leu Gly Gln Ile
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Ser Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Pro Gln Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ser Ala Ala Met Met Met Gln Arg Gly Asn Phe

370 375 380

Arg Asn Ser Arg Lys Pro Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala
420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn
435 440 445

Phe Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe
450 455 460

Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Pro Glu Pro Ile
465 470 475 480

Asp Arg Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn
485 490 495

Asp Pro Ser Ser Gln
500

<210> 169
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<400> 169

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Gly Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Thr Gln Gln Ala Ala Ala Gly Ala Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Leu Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys

260 265 270

Val Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Thr Ser Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380
Thr Gln Arg Arg Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Ser Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480

Lys Glu Leu Tyr Pro Leu Val Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln
500

<210> 170
<211> 501
<212> PRT
<213> Human immunodeficiency virus
<400> 170
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Pro Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Ala Gly Asn Asn Ser Gln Val

115 120 125

Ser Gln Asn Phe Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Ala Thr Asn Asn Ser Val Ser Ile Met Met Gln Arg Gly Asn Phe
370 375 380
Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly
385 390 395 400
His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys
405 410 415

Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala
420 425 430
Asn Phe Leu Gly Lys Ile Trp Pro Ser Arg Lys Gly Arg Pro Gly Asn
435 440 445
Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe
450 455 460
Arg Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Asp Pro Ile
465 470 475 480

Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn
485 490 495
Asp Pro Ser Ser Gln
500

<210> 171
<211> 503
<212> PRT
<213> Human immunodeficiency virus
<400> 171
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ile Lys
100 105 110
Lys Arg Val Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Asn Ser Ser
115 120 125
Gln Val Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln
130 135 140
Met Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160

Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser
165 170 175
Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190
Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205
Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly
210 215 220

Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240
Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn
245 250 255
Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly
260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile
275 280 285

Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300
Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met
305 310 315 320
Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile
325 330 335
Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350

Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu
355 360 365
Ala Met Ser Gln Val Thr Asn Pro Ala Asn Ile Met Met Gln Arg Gly
370 375 380
Asn Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys
385 390 395 400
Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys
405 410 415

Trp Lys Cys Gly Lys Glu Gly His Gln Ile Lys Asp Cys Thr Glu Arg
420 425 430
Gln Ala Asn Phe Leu Gly Arg Ile Trp Pro Ser Asn Lys Gly Arg Pro
435 440 445
Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu
450 455 460
Ser Phe Arg Phe Gly Glu Glu Thr Ala Thr Pro Pro Gln Lys Gln Glu
465 470 475 480

Pro Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe
485 490 495
Gly Ser Asp Pro Ser Ser Gln
500

<210> 172

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<400> 172

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Ser Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ile Lys
100 105 110

Lys Arg Thr Gln Gln Ala Ala Ala Asp Thr Gly Asn Asn Ser Pro Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Asn Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Ile Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Asp Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Ala Gln Ala Gly Pro Ala Ala

210 215 220

Pro Gly Gln Val Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Gln Asn Ser Asn Ser Ile Met Met Gln Arg Gly Asn Phe Lys
370 375 380
Asn Gln Arg Lys Ser Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Pro Thr Ala Pro
450 455 460

Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln
465 470 475 480

Lys Gln Gly Pro Ile Asp Lys Glu Leu Tyr Pro Ser Ala Ser Leu Arg
485 490 495
Ser Leu Phe Gly Asn Asp Pro
500

<210> 173
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<400> 173
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Thr Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Val Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Gly Ile Glu Val Arg Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Lys Lys
100 105 110
Asn Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Lys Pro Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Pro Thr Thr Ile Met Met Gln Arg Gly Asn Phe Lys
370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp
465 470 475 480

Lys Glu Leu Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Ser Asp
485 490 495
Pro Ser Ser Gln
500

<210> 174
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<400> 174
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Pro Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Thr Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Thr His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Ala Pro Asn Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380

Ser Gln Arg Arg Pro Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg
450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Leu Val Asp
465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 175
<211> 503
<212> PRT
<213> Human immunodeficiency virus
<400> 175

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ala Leu Lys Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Arg Val Gln Gln Ala Ala Ala Ala Ala Ala Asp Thr Gly Asn Lys
115 120 125

Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln
130 135 140

Met Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160

Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr
165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly
210 215 220

Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240

Gly Thr Thr Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr Ser Asn
245 250 255

Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly
260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile
275 280 285

Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met
305 310 315 320
Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile
325 330 335
Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350

Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu
355 360 365
Ala Met Ser Gln Val Thr Asn Ser Pro Thr Val Met Met Gln Lys Gly
370 375 380
Asn Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys
385 390 395 400
Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys
405 410 415

Trp Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg
420 425 430
Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro
435 440 445
Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu
450 455 460
Ser Phe Gly Phe Gly Glu Glu Thr Thr Ala Pro Pro Gln Lys Gln Glu
465 470 475 480

Pro Ile Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe
485 490 495
Gly Asn Asp Pro Ser Ser Gln
500

<210> 176
<211> 511
<212> PRT
<213> Human immunodeficiency virus
<400> 176
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Gln Gly Cys Thr Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Glu Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Ala Glu Gln Met Ala Trp Ile Thr Gly Asn Pro Pro Val
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Arg Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Thr Thr Asn Ile Met Met Gln Lys Ser Asn Phe Arg
370 375 380
Gly Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Pro Gln Ser Arg Leu
450 455 460
Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr
465 470 475 480

Thr Ala Leu Pro Gln Arg Gln Glu Leu Ile Asp Lys Glu Gln His His
485 490 495
Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Leu Ser Gln

500 505 510

<210> 177

<211> 505

<212> PRT

<213> Human immunodeficiency virus

<400> 177

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Gln Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr His Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Arg Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Phe Lys Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Gln Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Ser Gly Ser
115 120 125

Ser Pro Ala Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln
130 135 140

Met Val His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys

145 150 155 160

Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser

165 170 175

Ala Leu Ala Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Ala Gln Ala Gly

210 215 220

Pro Val Ala Pro Gly Gln Val Arg Glu Pro Arg Gly Ser Asp Ile Ala

225 230 235 240

Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn

245 250 255

Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly

260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile

275 280 285

Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr

290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met

305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile

325 330 335

Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala

340 345 350

Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu

355 360 365

Ala Met Ser Gln Val Thr Gly Ser Ala Ala Thr Val Met Met Gln Arg

370 375 380

Gly Asn Phe Lys Asn Gln Arg Lys Ser Val Lys Cys Phe Asn Cys Gly

385 390 395 400

Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly

405 410 415

Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu

420 425 430

Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg

435 440 445

Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala

450 455 460

Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln

465 470 475 480

Glu Leu Val Asp Lys Glu Met Tyr Pro Pro Leu Thr Ser Leu Arg Ser

485 490 495

Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505

<210> 178

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 178

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Lys Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Gln Ser Leu His Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ile Lys

100 105 110

Lys Arg Ala Gln Gln Ala Ala Ala Asp Thr Lys Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Arg Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Val Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Gln Glu Gly His Gln Met Lys Asp Cys Thr Gly Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Asn Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Ala Glu Glu Thr Ala Thr Pro Pro Gln Lys Arg Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 179

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<400> 179

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Thr Leu Gly Ala Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Asn Ile Glu Ile Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Arg Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Arg Thr Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Thr Thr Ser Thr Asn Ile Met Met Gln Arg Gly Asn Phe Arg Asn

370 375 380

Gln Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile

385 390 395 400

Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415

Gln Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe

450 455 460

Gly Glu Glu Thr Met Ala Ala Ala Pro Ser Gln Lys Gln Glu Pro Lys

465 470 475 480

Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn

485 490 495

Asp Pro Leu Ser Gln

500

<210> 180

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<400> 180

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Asn Lys Arg Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
His Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80
Thr Ile Ala Thr Leu Tyr Cys Val His Gln Gln Ile Asp Val Lys Asp

85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Asn Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Ser Ser Ser Gln Asn
115 120 125
Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln Ala Leu
130 135 140
Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys Ala

145 150 155 160
Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu Gly Ala
165 170 175
Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His Gln
180 185 190
Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu
195 200 205
Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala Pro Gly Gln

210 215 220
Leu Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Asn Leu
225 230 235 240
Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro Pro Ile Pro Val Gly
245 250 255
Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg
260 265 270
Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu

275 280 285
Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu

290 295 300

Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val
305 310 315 320
Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro
325 330 335
Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly

340 345 350
Pro Ala His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Ala Thr
355 360 365
Gly Ala Ala Ala Asn Ile Met Met Gln Lys Gly Asn Phe Arg Asn Gln
370 375 380
Arg Arg Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile Ala
385 390 395 400
Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Glu

405 410 415
Glu Gly His Gln Met Lys Asn Cys Pro Gly Arg Gln Ala Asn Phe Leu
420 425 430
Gly Lys Val Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu Gln
435 440 445
Ser Arg Pro Glu Pro Thr Ala Pro Ser Ala Pro Pro Ala Glu Ser Phe
450 455 460
Arg Phe Gly Glu Glu Met Thr Ala Pro Ser Gln Lys Gln Glu Thr Pro

465 470 475 480
Lys Glu Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn
485 490 495
Asp Pro Ser Ser Gln
500

<210> 181
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<400> 181

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30
His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Ala Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Ile Lys Asp

85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Thr Gln Gln Ala Ala Ala Asp Thr Gly Ser Ser Ser Gln Val
115 120 125
Ser His Asn Phe Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Met Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Thr Thr Asn Thr Thr Ala Met Met Met Gln Arg Gly Asn Phe Lys

370 375 380

Asn Gln Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Val Ala Thr Pro Val Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Met Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 182

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 182

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Gly Glu Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Ala Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Pro Gly Lys Asn Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Met His Pro Val Gln Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Pro Val

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys His Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Gln Asn Thr Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Ile Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Val Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg

450 455 460

Val Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Glu Pro Thr Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Ser Asp

485 490 495

Pro Ser Ser Gln

500

<210> 183

<211> 504

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (28)..(28)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (48)..(48)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (102)..(102)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (130)..(130)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (313)..(313)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (372)..(372)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (390)..(390)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
<222> (431)..(431)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (471)..(471)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (482)..(482)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (486)..(487)
<223> Xaa can be any naturally occurring amino acid
<400> 183

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Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Gly Leu Asp Arg Trp
1               5                  10                  15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Xaa Tyr Arg Leu Lys
            20                  25                  30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Xaa
        35                  40                  45
Ser Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
    50                  55                  60
His Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65                  70                  75                  80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Ile Lys Asp
                85                  90                  95
Thr Lys Glu Ala Leu Xaa Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
            100                 105                 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Asn Gly Asn
        115                 120                 125
Ser Xaa Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly
```

130 135 140

Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val
145 150 155 160
Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe
165 170 175
Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu
180 185 190
Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr
195 200 205

Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala
210 215 220
Gly Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile
225 230 235 240
Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Ile Thr Asn
245 250 255
Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu
260 265 270

Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp
275 280 285
Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe
290 295 300
Tyr Lys Thr Leu Arg Ala Glu Gln Xaa Ser Gln Glu Val Lys Asn Trp
305 310 315 320
Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr
325 330 335

Ile Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr
340 345 350
Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala
355 360 365
Glu Ala Met Xaa Gln Met Thr Ser Ser Ala Thr Ile Met Met Gln Arg
370 375 380

Gly Asn Phe Arg Asn Xaa Arg Arg Thr Val Lys Cys Phe Asn Cys Gly
385 390 395 400

Lys Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly
405 410 415
Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Xaa Glu
420 425 430
Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg
435 440 445
Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu
450 455 460

Glu Ser Phe Arg Phe Gly Xaa Glu Lys Thr Thr Pro Ser Gln Lys Gln
465 470 475 480
Glu Xaa Ile Asp Lys Xaa Xaa Tyr Pro Leu Ala Ser Leu Lys Ser Leu
485 490 495
Phe Gly Asn Asp Pro Ser Ser Gln
500

<210> 184
<211> 499
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (325)..(325)
<223> Xaa can be any naturally occurring amino acid

<400> 184
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Arg Lys Ile Asp Val Arg Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Asn Arg Gln Val Ser
115 120 125

Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln
130 135 140
Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu
145 150 155 160
Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ala Glu
165 170 175
Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly
180 185 190

His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala
195 200 205
Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala Pro
210 215 220
Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser
225 230 235 240
Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro
245 250 255

Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile
260 265 270
Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly Pro
275 280 285
Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg
290 295 300

Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu
305 310 315 320

Leu Val Gln Asn Xaa Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu
325 330 335
Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val
340 345 350
Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln
355 360 365
Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Lys Asn
370 375 380

Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile
385 390 395 400
Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly
405 410 415
Lys Glu Gly His Gln Met Lys Asp Cys Met Glu Arg Gln Ala Asn Phe
420 425 430
Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu
435 440 445

Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe
450 455 460
Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp Lys
465 470 475 480
Glu Gln Tyr Pro Leu Thr Ala Leu Arg Ser Leu Phe Gly Ser Asp Pro
485 490 495
Ser Ser Gln

<210> 185
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<220><221
> misc_feature

<222> (11)..(11)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (23)..(23)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (69)..(69)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (76)..(76)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (79)..(79)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (86)..(86)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (95)..(95)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (114)..(114)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (373)..(373)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (375)..(375)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (383)..(383)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (474)..(474)

<223> Xaa can be any naturally occurring amino acid

<400> 185

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Xaa Lys Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Xaa Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Ile Gln Leu
50 55 60

Gln Pro Ser Leu Xaa Thr Gly Ser Glu Glu Leu Xaa Ser Leu Xaa Asn
65 70 75 80

Thr Ile Ala Thr Leu Xaa Cys Val His Gln Asn Ile Glu Val Xaa Asp
85 90 95

Thr Lys Glu Ala Leu Glu Arg Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Thr Xaa Ala Gln Gln Ala Ala Ala Asn Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Asn Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Ile Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Ser Leu Gln Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Ile Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Xaa Thr Xaa Val Met Met Gln Arg Gly Asn Xaa Arg

370 375 380

Asn Gln Arg Lys Ile Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Gln Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Xaa Lys Gln Glu Gln Ile Asp

465 470 475 480

Lys Asp Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 186

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (114)..(114)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (125)..(125)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (400)..(400)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (408)..(408)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (418)..(418)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (434)..(434)

<223> Xaa can be any naturally occurring amino acid

<400> 186

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

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His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
        35                  40                  45
Gly Leu Met Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
    50                  55                  60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65                  70                  75                  80
Thr Leu Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Ile Lys Asp
                85                  90                  95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
            100                 105                 110
Lys Xaa Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Xaa Ser Gln Val
        115                 120                 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
    130                 135                 140
Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145                 150                 155                 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
                165                 170                 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
            180                 185                 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
        195                 200                 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
    210                 215                 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225                 230                 235                 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
                245                 250                 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
            260                 265                 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Glu Ile Arg Gln Gly
```

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Ser Ser Ala Asn Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Xaa
385 390 395 400
Ala Lys Asn Cys Arg Ala Pro Xaa Lys Arg Gly Cys Trp Lys Cys Gly
405 410 415

Lys Xaa Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe
420 425 430
Leu Xaa Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu
435 440 445
Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe
450 455 460
Gly Glu Glu Thr Thr Thr Cys Ser Gln Lys Gln Glu Gln Ile Asp Lys
465 470 475 480

Glu Met Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro
485 490 495
Ser Ser Gln

<210> 187
<211> 499

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (271)..(271)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (356)..(356)

<223> Xaa can be any naturally occurring amino acid

<400> 187

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Ser Ser Glu Gly Cys Lys Gln Ile Leu Ala Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ser Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Ser Gln

115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val

130 135 140

His Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile

145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu

165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val

180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu

195 200 205

Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Ile

210 215 220

Ala Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr

225 230 235 240

Thr Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr Arg Asn Pro Pro

245 250 255

Ile Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Xaa Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln

275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Cys Thr Gln Asp Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys

325 330 335

Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Xaa Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Ser Lys Ala Asn Ser Thr Thr Ile Met Val Gln Arg Gly Gln Phe Lys

370 375 380

Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Gln Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Val Glu Ser Phe Gly

450 455 460

Phe Gly Glu Glu Thr Ala Thr Pro Pro Gln Lys Gln Glu Pro Asp Lys

465 470 475 480

Asp Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro

485 490 495

Leu Ser Gln

<210> 188

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (15)..(15)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (190)..(190)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (216)..(216)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (269)..(269)

<223> Xaa can be any naturally occurring amino acid

<400> 188

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Xaa Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Lys Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Asn Ile Glu Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Gly Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Xaa Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu Xaa Pro Ala Gln Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Ala Trp Thr Thr Gly Asn Pro Ala Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Xaa Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Ile Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
His Leu Thr Asn Ser Ala Val Met Met Gln Arg Gly Asn Phe Lys Asn
370 375 380
Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Asp Gly His Leu
385 390 395 400
Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415
Lys Glu Gly His Gln Met Lys Asp Cys Asp Glu Arg Gln Ala Asn Phe
420 425 430
Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu
435 440 445
Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg Phe
450 455 460
Gly Glu Glu Thr Ala Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp Lys

465 470 475 480
Glu Pro Leu Tyr Pro Ser Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495
Pro Leu Leu Gln
500

<210> 189
<211> 500
<212> PRT
<213> Human immunodeficiency virus

<400> 189

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Ala Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Arg Tyr Lys Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Ala Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415
Gly Lys Asp Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Ile Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Gln Ile Asp

465 470 475 480
Lys Glu Lys Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 190

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (58)..(58)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (63)..(63)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (79)..(79)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (82)..(82)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (90)..(90)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (94)..(94)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (122)..(122)

<223> Xaa can be any naturally occurring amino acid

<

220><221> misc_feature

<222> (216)..(216)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (268)..(268)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (292)..(292)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (307)..(307)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (384)..(384)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (389)..(389)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (409)..(409)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (462)..(462)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (486)..(486)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (488)..(488)

<223> Xaa can be any naturally occurring amino acid

<400> 190

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Xaa Gln Ile Leu Gly Xaa Leu

50 55 60

Gln Pro Ser Leu Gln Ala Gly Ser Glu Glu Leu Lys Ser Leu Xaa Asn
65 70 75 80
Thr Xaa Ala Val Leu Tyr Cys Val His Xaa Arg Ile Glu Xaa Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Gln Ala Gln Gln Ala Ala Ala Asp Xaa Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Asp Trp Asp Arg Leu Xaa Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Xaa Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Xaa Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Xaa Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Pro Asn Thr Ile Met Met Gln Arg Gly Asn Phe Xaa
370 375 380

Asn Gln Arg Lys Xaa Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Xaa Lys Arg Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Xaa Phe Arg
450 455 460
Phe Gly Glu Glu Thr Ala Thr Pro Pro Gln Lys Gln Glu Gln Thr Asp
465 470 475 480
Lys Glu Leu Tyr Pro Xaa Thr Xaa Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495
Pro Leu Ser Gln
500

<210> 191
<211> 503
<212> PRT
<213> Human immunodeficiency virus
<220
><221> misc_feature

<222> (207)..(207)

<223> Xaa can be any naturally occurring amino acid

<400> 191

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Ser Pro Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Gln Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Pro Gln Ala Gln Ala Ala Ala Ala Asp Thr Gly Asn Arg
115 120 125

Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln
130 135 140

Met Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160

Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser
165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Xaa Ile
195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Met His Pro Val His Ala Gly
210 215 220

Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala

225 230 235 240

Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn

245 250 255

Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly

260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile

275 280 285

Arg Gln Gly Pro Lys Glu Ser Phe Arg Asp Tyr Val Asp Arg Phe Tyr

290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met

305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile

325 330 335

Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala

340 345 350

Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu

355 360 365

Ala Met Ser Gln Val Thr Ser Pro Ala Thr Val Met Met Gln Arg Gly

370 375 380

Asn Phe Arg Asn Gln Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Lys

385 390 395 400

Asp Gly His Ile Ala Arg Asn Cys Lys Ala Pro Arg Lys Lys Gly Cys

405 410 415

Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Pro Asn Arg

420 425 430

Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro

435 440 445

Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu

450 455 460

Ser Phe Arg Phe Gly Glu Gly Thr Thr Thr Pro Pro Gln Lys Gln Glu

465 470 475 480

Leu Ile Asp Lys Asp Leu Tyr Pro Ser Ala Ser Leu Lys Ser Leu Phe
485 490 495
Gly Asn Asp Pro Leu Leu Gln
500

<210> 192
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<400> 192
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Ser Ser Ser Gln Ser

115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Thr Ala Ile Met Met Gln Arg Gly Asn Ser Arg

370 375 380

Pro Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Ile Gln Asn Arg Leu Glu Pro Thr Ala Pro Pro Glu Glu Ile Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Arg Asp

465 470 475 480

Lys Glu Gln Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 193

<211> 507

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (166)..(166)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (325)..(325)

<223> Xaa can be any naturally occurring amino acid

<400> 193

Met Gly Ala Arg Ala Ser Val Leu Ser Ala Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Thr Gln Gln Ala Ala Ala Gly Ala Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln
130 135 140
Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160

Val Val Glu Glu Lys Xaa Phe Ser Pro Glu Val Ile Pro Met Phe Ser
165 170 175
Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190
Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205
Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly
210 215 220

Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240
Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn
245 250 255
Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly
260 265 270
Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile
275 280 285

Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300
Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met
305 310 315 320
Thr Glu Thr Leu Xaa Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile

325 330 335

Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350

Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu
355 360 365

Ala Met Ser Gln Val Thr Gly Pro Ala Ala Val Met Met Gln Arg Gly
370 375 380

Asn Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys
385 390 395 400

Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys
405 410 415

Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg
420 425 430

Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro
435 440 445

Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro
450 455 460

Pro Glu Glu Ile Phe Arg Phe Gly Glu Glu Thr Thr Asn Pro Ser Gln
465 470 475 480

Lys Gln Glu Thr Met Glu Lys Glu Leu Tyr Pro Pro Leu Ala Ser Leu
485 490 495

Lys Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 194

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (493)..(493)

<223> Xaa can be any naturally occurring amino acid

<400> 194

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30
His Leu Val Trp Val Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Ile Glu Gln Leu
50 55 60
Pro Pro Ser Leu Pro Thr Gly Ser Glu Glu Leu Arg Ser Val Tyr Asn
65 70 75 80

Ala Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser
115 120 125
Arg Gln Val Ser Gln Asn Phe Pro Ile Val Gln Asn Leu Gln Gly Gln
130 135 140

Met Val His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160
Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Ile Ile Pro Met Phe Ser
165 170 175
Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190
Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly
210 215 220
Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240
Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn
245 250 255

Pro Pro Ile Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly
260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile
275 280 285

Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met
305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile
325 330 335

Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350

Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu
355 360 365

Ala Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly
370 375 380

Asn Val Arg Asn Gln Arg Arg Ile Ile Lys Cys Phe Asn Cys Gly Lys
385 390 395 400

Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys
405 410 415

Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg
420 425 430

Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro
435 440 445

Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu
450 455 460

Ser Phe Arg Phe Gly Glu Glu Thr Ala Ala Pro Ser Gln Lys Gln Glu
465 470 475 480

Thr Ile Asp Lys Glu Met Tyr Pro Ile Thr Ser Leu Xaa Ser Leu Phe
485 490 495

Gly Asn Asp Pro Ser Ser Gln

500

<210> 195

<211> 497

<212> PRT

<213> Human immunodeficiency virus

<400> 195

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Lys Gln Ile Leu Asn Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Glu Ser Lys
100 105 110

Lys Lys Thr Gln Gln Ala Ala Ala Gly Thr Ser Gln Val Ser Gln Asn
115 120 125

Phe Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln Ala Ile
130 135 140

Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys Ala
145 150 155 160

Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu Gly Ala
165 170 175

Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His Gln
180 185 190

Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu

195 200 205

Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala Pro Gly Gln
210 215 220
Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu
225 230 235 240
Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile Pro Val Gly
245 250 255
Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg
260 265 270

Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile Lys Gln Gly Pro Lys Glu
275 280 285
Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu
290 295 300
Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val
305 310 315 320
Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro
325 330 335

Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly
340 345 350
Pro Ala His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Val Thr
355 360 365
Asn Pro Ala Thr Thr Met Met Gln Arg Gly Asn Phe Arg Asn Gln Arg
370 375 380
Arg Val Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile Ala Lys
385 390 395 400

Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Gln Glu
405 410 415
Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe Leu Gly
420 425 430
Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu Gln Ser
435 440 445

Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg Phe Gly Glu
450 455 460

Glu Ile Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp Lys Glu Leu
465 470 475 480
Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser Ser
485 490 495
Gln

<210> 196
<211> 503
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (91)..(91)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (125)..(125)
<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
<222> (127)..(127)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (130)..(130)
<223> Xaa can be any naturally occurring amino acid
<400> 196
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45
Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Leu Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Xaa Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Ala Gln Gln Ala Ala Ala Asp Thr Xaa Asn Xaa Ser

115 120 125

Gln Xaa Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met

130 135 140

Val His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala

165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn

195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Pro Gln Ala Gly Pro

210 215 220

Ile Ala Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Thr Trp Met Thr Asn Asn Pro

245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr
305 310 315 320
Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335
Lys Ala Leu Gly Pro Gly Ala Ser Leu Glu Glu Met Met Thr Ala Cys
340 345 350
Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365
Met Ser Gln Met Thr Gly Ala Ala Asn Ser Ile Met Met Gln Arg Gly
370 375 380
Asn Phe Lys Asn Asn Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys
385 390 395 400
Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys
405 410 415
Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg

420 425 430
Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro
435 440 445
Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu
450 455 460
Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Cys Gln Lys Gln Glu
465 470 475 480
Pro Lys Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe

485 490 495
Gly Asn Asp Pro Ser Ser Gln
500

<210> 197
<211> 506
<212> PRT
<213> Human immunodeficiency virus
<400> 197
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Gly Ile Gly Val Arg Asp

85 90 95

Thr Lys Glu Ala Ile Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser Ser

115 120 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met

130 135 140

Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala

165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn

195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro

210 215 220

Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro

245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu
260 265 270
Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg
275 280 285
Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300
Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr
305 310 315 320
Glu Thr Leu Leu Ile Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335
Lys Ala Leu Gly Gln Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350
Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365
Met Ser Gln Val Thr Thr Pro Pro Asn Ala Ile Met Met Gln Arg Gly
370 375 380
Asn Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys
385 390 395 400
Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys
405 410 415
Trp Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg

420 425 430
Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro
435 440 445
Gly Asn Phe Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Thr Ala Pro
450 455 460
Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr His Ser Gln
465 470 475 480
Lys Gln Glu Thr Ile Asp Lys Glu Met Tyr Pro Leu Ala Ser Leu Lys

485 490 495
Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505

<210> 198

<211> 504

<212> PRT

<213> Human immunodeficiency virus

<400> 198

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

His Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Val Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Pro Ala Ala Ala Ala Ala Ser Ala Gly Ser Asn Ser
115 120 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140

Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala

165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro

210 215 220

Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro

245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Ala Thr Asn Ser Val Asn Ile Met Met Gln Arg Gly Asn

370 375 380

Phe Arg Ser Pro Lys Arg Ile Val Lys Cys Phe Asn Cys Gly Lys Glu

385 390 395 400

Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser

450 455 460

Phe Lys Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Ile

465 470 475 480

Ile Asp Arg Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu

485 490 495

Phe Gly Ser Asp Pro Ser Ser Gln

500

<210> 199

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (165)..(165)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (232)..(232)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (264)..(264)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (310)..(310)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (373)..(373)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (479)..(479)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (482)..(482)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (486)..(486)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (501)..(501)

<223> Xaa can be any naturally occurring amino acid

<400> 199

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Ala Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Ser Gln
115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val
130 135 140

His Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val
145 150 155 160

Glu Glu Lys Asn Xaa Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu
165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Ile
180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu

195 200 205

Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile

210 215 220

Ala Pro Gly Gln Met Arg Glu Xaa Arg Gly Ser Asp Ile Ala Gly Thr

225 230 235 240

Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro

245 250 255

Ile Pro Val Gly Glu Ile Tyr Xaa Arg Trp Ile Val Leu Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln

275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Xaa Ser Gln Glu Val Lys Gly Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys

325 330 335

Ala Met Gly Pro Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Ser Xaa Ala Asn Ile Met Met Gln Arg Ser Asn Phe Arg

370 375 380

Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Lys Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Gln Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro Glu Glu
450 455 460
Ser Phe Arg Phe Gly Glu Gly Thr Thr Thr Pro Pro Gln Lys Xaa Glu
465 470 475 480
Gln Xaa Asp Lys Glu Xaa Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe
485 490 495

Gly Asn Asp Pro Xaa Ser Gln
500

<210> 200
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (116)..(116)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (298)..(298)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (407)..(407)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (477)..(477)
<223> Xaa can be any naturally occurring amino acid

<400> 200
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Lys Tyr Arg Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Ser Ala Gln Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Thr Lys Ser Lys
100 105 110
Lys Lys Ala Xaa Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Ala Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Asp Trp Met Thr His Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Xaa Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Gly Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Arg Ala
325 330 335
Leu Gly Pro Gly Ala Gln Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Ser Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380

Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Asn Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Xaa Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Asp Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Gly
450 455 460
Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Xaa Ser Ile Asp
465 470 475 480
Lys Asp Leu Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln
500

<210> 201
<211> 502
<212> PRT
<213> Human immunodeficiency virus
<220
><221> misc_feature

<222> (163)..(163)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (448)..(448)

<223> Xaa can be any naturally occurring amino acid

<400> 201

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ala Leu Lys Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Thr Ser
115 120 125

Thr Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140

Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160

Val Glu Xaa Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala
165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro

210 215 220

Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro

245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Arg

290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Met Thr Gln Pro Ala Thr Ile Met Met Gln Arg Gly Asn

370 375 380

Phe Arg Asn Gln Arg Lys Ser Val Lys Cys Phe Asn Cys Gly Lys Glu

385 390 395 400

Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Xaa

435 440 445

Asn Phe Pro Gln Gly Arg Leu Glu Pro Thr Ala Pro Pro Glu Glu Gly

450 455 460

Phe Arg Met Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Gly Ser

465 470 475 480

Met Asn Lys Glu Leu Asn Pro Leu Val Ser Leu Lys Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln

500

<210> 202

<211> 509

<212> PRT

<213> Human immunodeficiency virus

<400> 202

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Gln Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Trp Cys Val His Gln Lys Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Leu Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Gln Gln Ala Ala Ala Gly Thr

115 120 125

Gly Asn Asn Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu

130 135 140

Gln Gly Gln Met Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala

145 150 155 160

Trp Val Lys Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro

165 170 175

Met Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr

180 185 190

Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys

195 200 205

Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val

210 215 220

His Ala Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser

225 230 235 240

Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met

245 250 255

Thr His Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile

260 265 270

Ile Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile

275 280 285

Leu Asp Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp

290 295 300

Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys

305 310 315 320

Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys

325 330 335

Lys Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met

340 345 350

Met Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val

355 360 365

Leu Ala Glu Ala Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met

370 375 380

Gln Lys Gly Asn Phe Asn Tyr Gln Arg Lys Pro Ile Lys Cys Phe Asn

385 390 395 400

Cys Gly Lys Ala Gly His Ile Ala Lys His Cys Lys Ala Pro Arg Lys

405 410 415

Lys Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys

420 425 430

Asn Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys

435 440 445

Gly Arg Pro Gly Asn Phe Leu Gln Asn Arg Pro Glu Pro Ser Ala Pro

450 455 460

Pro Glu Glu Ile Phe Arg Phe Gly Glu Glu Thr Thr Pro Ser Gln Lys

465 470 475 480

Gln Glu Thr Arg Asp Arg Asp Arg Asp Lys Glu Leu Tyr Pro Ser Ala

485 490 495

Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Leu Leu Gln

500 505

<210> 203

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<400> 203

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Gly Ile Arg Leu Arg Pro Gly Gly Asn Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Pro Ala Ala Ala Asp Thr Gly Asn Ser Ser Ser Ser

115 120 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met

130 135 140

Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala

165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn

195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro

210 215 220

Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Asn Leu Gln Glu Gln Ile Asn Trp Met Thr Gly Asn Pro

245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365

Met Ser Gln Val Asn Gln Thr Asn Ile Met Met Gln Arg Gly Asn Phe
370 375 380

Arg Asn Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly
385 390 395 400

His Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys
405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala
420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn
435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe
450 455 460

Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Arg
465 470 475 480

Asp Arg Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe
485 490 495

Gly Asn Asp Pro Ser Ser Gln
500

<210> 204
<211> 499
<212> PRT
<213> Human immunodeficiency virus
<400> 204

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Gly Gly Cys Lys Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Lys Asp Ile Glu Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Ser Asn Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn His Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Met His Pro Val Gln Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Leu Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Val Ala Trp Met Thr His Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Thr Pro Gly Thr Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380
Asn Gln Lys Lys Ser Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Ile Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Thr Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Val Glu Glu Lys Asn Pro Ser Gln Lys Gln Glu Gln Ile Asp Lys
465 470 475 480

Glu Leu Tyr Pro Ser Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro
485 490 495
Ser Ser Gln

<210> 205
<211> 499
<212> PRT
<213> Human immunodeficiency virus
<400> 205
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Gln Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Met Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Asn Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala
210 215 220

Pro Gly Gln Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Ser Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Ile Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Gly Ser Ala Asn Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Pro Pro Gln Lys Gln Glu Thr Thr Asp Lys
465 470 475 480

Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro
485 490 495
Ser Ser Gln

<210> 206

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<400> 206

Met Gly Ala Arg Ala Ser Val Ile Ser Gly Ala Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Ser Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Val Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Val Thr Leu Tyr Cys Val His Arg Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Asn Ala Gln Gln Val Gln Gln Ala Ala Ala Gly Thr Gly Asn Ser
115 120 125

Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln
130 135 140

Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160

Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser
165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly
210 215 220

Pro Ala Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240
Gly Ser Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn
245 250 255
Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly
260 265 270
Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile
275 280 285

Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300
Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met
305 310 315 320
Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile
325 330 335
Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350

Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu
355 360 365
Ala Met Ser Gln Ala Thr Gln Ser Asn Ala Ile Met Met Gln Arg Gly
370 375 380
Asn Phe Lys Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys
385 390 395 400
Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys
405 410 415

Trp Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg
420 425 430
Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Asn Lys Gly Arg Pro
435 440 445
Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro

450 455 460

Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Lys Thr Ala Pro Val Gln
465 470 475 480

Lys Gln Glu Pro Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys
485 490 495

Ser Leu Phe Gly Asn Asp Pro
500

<210> 207

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 207

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Ser Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Thr Gly Thr Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Ser Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Val Gly Trp Met Thr Ser Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Asn Pro Asn Ala Ile Met Met Gln Arg Gly Asn Phe Arg Asn
370 375 380
Gln Lys Arg Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His Leu
385 390 395 400

Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly
405 410 415

Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala Asn Phe
420 425 430
Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn Phe Leu
435 440 445
Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro Glu Glu Ser
450 455 460
Phe Arg Phe Gly Glu Gly Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro
465 470 475 480

Lys Asp Lys Glu Leu Tyr Pro Val Thr Ser Leu Arg Ser Leu Phe Gly
485 490 495
Asn Asp Pro Ser Ser Gln
500

<210> 208
<211> 501
<212> PRT
<213> Human immunodeficiency virus
<400> 208
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Ala Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Ile Arg Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Ile Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Lys
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Ile Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Asp Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Ile Ala Thr Pro Pro Ala Ile Met Met Gln Arg Gly Asn Phe Lys
370 375 380
Asn Gln Arg Lys Val Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys His Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Ala Thr Pro Pro Gln Lys Gln Glu Pro Pro Val
465 470 475 480

Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn
485 490 495
Asp Pro Ser Ser Gln
500

<210> 209
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<400> 209
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Leu Gly Arg Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

His Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Ile Val Val Leu Tyr Cys Val His Gln Gly Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Glu Lys Ala Gln Gln Ala Ala Ala Asp Thr Arg Asn Lys Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Pro Thr Asn Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Ala Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp
465 470 475 480

Lys Glu Met Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln
500

<210> 210
<211> 500
<212> PRT
<213> Human immunodeficiency virus

<400> 210

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Thr Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Lys Gln Ile Leu Ala Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Ala Val Ala Val Leu Tyr Cys Val His Arg Lys Ile Asp Val Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Val Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Arg Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Pro Ile Thr Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Met His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Asp Trp Met Thr His Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Gln Gly Thr Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380

Asn Gln Arg Lys Ile Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Ile Ala Lys His Cys Lys Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Gly
450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Gly Thr Ile Asp
465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 211

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<400> 211

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Thr Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Ser Asn Ser

115 120 125

Lys Val Ser Gln Asn Tyr Pro Val Val Gln Asn Met Gln Gly Gln Met

130 135 140

Val His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Ile Glu Glu Lys Ala Phe Ser Pro Glu Ile Ile Pro Met Phe Ser Ala

165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn
195 200 205
Glu Glu Ala Ala Asp Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro
210 215 220

Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240
Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro
245 250 255
Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu
260 265 270
Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg
275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Arg
290 295 300
Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr
305 310 315 320
Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335
Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365
Met Ser Gln Ile Ala Thr Pro Pro Thr Val Met Met Gln Arg Gly Asn
370 375 380
Phe Arg Asn Gln Arg Lys Val Val Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400
Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp
405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln
420 425 430
Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly

435 440 445

Asn Phe Pro Gln Ser Arg Leu Glu Pro Thr Ala Pro Pro Glu Glu Ser

450 455 460

Leu Arg Glu Glu Thr Ile Thr Pro Pro Gln Arg Gln Glu Pro Pro Val

465 470 475 480

Asp Lys Glu Met Tyr Pro Trp Ala Ser Leu Lys Ser Leu Phe Gly Asn

485 490 495

Asp Pro Ser Ser Gln

500

<210> 212

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<400> 212

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Ser Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Val Glu Arg Leu Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Pro Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Ala Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Asp Thr Gly Asn Ser Asn Gln

115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val

130 135 140

```
His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val
145                 150                 155                 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu
                165                 170                 175
Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
            180                 185                 190
Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu
        195                 200                 205
Glu Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile
    210                 215                 220

Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
225                 230                 235                 240
Thr Ser Thr Leu Gln Glu Gln Val Gly Trp Met Thr Ser Asn Pro Pro
                245                 250                 255
Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn
            260                 265                 270
Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln
        275                 280                 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr
    290                 295                 300
Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu
305                 310                 315                 320
Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys
                325                 330                 335
Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln
            340                 345                 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met
        355                 360                 365
Ser Gln Val Thr Asn Gln Thr Ala Val Met Met Gln Arg Gly Lys Phe
    370                 375                 380
Thr Asn Gln Arg Lys Pro Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly
```

385 390 395 400

His Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Glu Cys Ser Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Met Glu Ser Phe

450 455 460

Arg Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Glu Gln Thr

465 470 475 480

Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn

485 490 495

Asp Pro Ser Ser Gln

500

<210> 213

<211> 504

<212> PRT

<213> Human immunodeficiency virus

<400> 213

Met Gly Ala Arg Ala Ser Val Ile Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Ser Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Tyr Ala Ile Asn Pro

35 40 45

Gly Leu Leu Glu Thr Gly Ala Gly Cys Lys Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Ala Ile Ala Val Leu Phe Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Arg Ile Gln Gln Ala Gln Gln Ala Ala Ala Ala Asp Thr Gly Asn
115 120 125
Ser Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly
130 135 140
Gln Met Val His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val
145 150 155 160

Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe
165 170 175
Ser Ala Leu Ala Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu
180 185 190
Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr
195 200 205
Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala
210 215 220

Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile
225 230 235 240
Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His
245 250 255
Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu
260 265 270
Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp
275 280 285

Ile Arg Gln Gly Pro Lys Glu Ser Phe Arg Asp Tyr Val Asp Arg Phe
290 295 300
Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp
305 310 315 320
Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr
325 330 335

Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr
340 345 350

Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala
355 360 365
Glu Ala Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys
370 375 380
Gly Asn Phe Arg Asn Gln Arg Lys Val Val Lys Cys Phe Asn Cys Gly
385 390 395 400
Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly
405 410 415

Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Ser Glu
420 425 430
Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg
435 440 445
Pro Gly Asn Phe Leu Gln Ser Arg Leu Glu Pro Thr Ala Pro Pro Glu
450 455 460
Glu Ser Phe Arg Phe Gly Glu Glu Lys Ala Pro Pro Pro Gln Lys Gln
465 470 475 480

Glu Ala Val Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu
485 490 495
Phe Gly Asn Asp Pro Ser Ser Gln
500

<210> 214
<211> 508
<212> PRT
<213> Human immunodeficiency virus
<400> 214
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Gln Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

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His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
        35                  40                  45
Gly Leu Leu Glu Thr Ser Gly Gly Cys Lys Gln Ile Leu Ala Gln Leu
    50                  55                  60
Gln Pro Ser Leu Lys Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65                  70                  75                  80
Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Gln Asp
                85                  90                  95

Thr Lys Glu Ala Leu Asp Arg Ile Glu Glu Glu Gln Asn Lys Ser Glu
            100                 105                 110
Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser
        115                 120                 125
Arg Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln
    130                 135                 140
Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145                 150                 155                 160

Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser
                165                 170                 175
Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
            180                 185                 190
Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
        195                 200                 205
Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly
    210                 215                 220

Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225                 230                 235                 240
Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn
                245                 250                 255
Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly
            260                 265                 270
Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile
```

275 280 285

Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300
Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met
305 310 315 320
Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile
325 330 335
Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350

Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu
355 360 365
Ala Met Ser Gln Val Asn Ser Ala Thr Val Met Met Gln Lys Gly Asn
370 375 380
Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400
Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp
405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Met Glu Arg Gln
420 425 430
Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly
435 440 445
Asn Phe Leu Gln Ser Lys Pro Glu Pro Thr Ala Pro Leu Glu Pro Thr
450 455 460
Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Arg Thr Thr Pro
465 470 475 480

Ser Gln Lys Gln Glu Pro Ile Asp Lys Gly Leu Tyr Pro Leu Ala Ser
485 490 495
Leu Arg Ser Leu Phe Gly Asn Asp Pro Leu Ser Gln
500 505

<210> 215

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<400> 215

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Gln Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Ser Tyr Lys Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

His Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Gln Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Lys Asn Asn Ser Gln
115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val
130 135 140

His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val

145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu

165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu
195 200 205

Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile

210 215 220

Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
225 230 235 240
Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro
245 250 255
Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn
260 265 270
Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln
275 280 285
Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr
290 295 300
Leu Arg Ala Glu Gln Gly Ser Gln Glu Val Lys Thr Trp Met Thr Glu
305 310 315 320
Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys
325 330 335
Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln
340 345 350
Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met
355 360 365
Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe
370 375 380
Lys Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Arg Glu Gly
385 390 395 400
His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys
405 410 415
Cys Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala
420 425 430
Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn
435 440 445
Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe
450 455 460
Arg Phe Gly Glu Glu Thr Ala Thr Pro Pro Gln Lys Gln Glu Pro Ile

465 470 475 480

Asp Lys Glu Met Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn

485 490 495

Asp Pro Ser Ser Gln

500

<210> 216

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 216

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ala Leu Asn Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Lys Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Pro Thr Asn Ile Met Met Gln Arg Gly Asn Phe Lys
370 375 380
Asn Gln Arg Lys Ser Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415
Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Gly Thr Thr Ile Pro Ser Gln Lys Gln Glu Gln Ile Asp

465 470 475 480

Lys Glu Met Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 217

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 217

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Thr Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Lys Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Arg Glu Gln Gln Val Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ser Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Asp Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ala Ala

210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Gly Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Val Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Gly Thr Ile Asp

465 470 475 480

Lys Asp Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 218

<211> 508

<212> PRT

<213> Human immunodeficiency virus

<400> 218

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Arg Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Ser Ser Ser Gln Val

115 120 125

Ser Gln Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly

130 135 140

Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val

145 150 155 160

Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe

165 170 175

Ser Ala Leu Ser Glu Gly Ala Thr Pro Gly Asp Leu Asn Thr Met Leu

180 185 190

Asn Thr Ile Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr

195 200 205

Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala

210 215 220

Gly Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile

225 230 235 240

Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser

245 250 255

Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu

260 265 270

Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp

275 280 285

Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe

290 295 300

Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp

305 310 315 320

Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr

325 330 335

Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr

340 345 350

Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala

355 360 365

Glu Ala Met Ser Gln Val Thr Thr Pro Pro Ala Ile Met Met Gln Arg

370 375 380

Gly Asn Phe Arg Asn Gln Arg Lys Val Val Lys Cys Phe Asn Cys Gly

385 390 395 400

Lys Glu Gly His Val Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly

405 410 415

Cys Trp Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu

420 425 430

Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg

435 440 445

Pro Gly Asn Phe Leu Gln Asn Arg Thr Glu Asn Arg Ile Glu Pro Thr

450 455 460

Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Ala Thr Pro

465 470 475 480

Pro Gln Lys Gln Glu Pro Ile Asp Lys Glu Thr Tyr Pro Leu Thr Ser

485 490 495

Leu Arg Ser Leu Phe Gly Asn Asp Pro Leu Ser Gln

500 505

<210> 219

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<400> 219

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Arg Leu Lys

20 25 30

His Val Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Ile Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly His Leu

50 55 60

Gln Ser Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asp Ser Ser Lys Gln

115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val

130 135 140

His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val

145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu

165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val

180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu

195 200 205

Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Pro

210 215 220

Ala Pro Gly Gln Leu Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr

225 230 235 240

Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Thr Asn Pro Pro

245 250 255

Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln
275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr
290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu
305 310 315 320

Thr Leu Leu Ile Gln Asn Ala Asn Pro Asp Cys Arg Thr Ile Leu Lys
325 330 335

Ala Leu Gly Pro Ala Pro Thr Leu Glu Glu Met Met Ser Ala Cys Gln
340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met
355 360 365

Ser His Met Thr Asn Ala Asn Thr Ile Met Met Gln Arg Gly Asn Phe
370 375 380

Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly
385 390 395 400

His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys
405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala
420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn
435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe
450 455 460

Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Arg
465 470 475 480

Asp Arg Glu Leu Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Asn
485 490 495

Asp Pro Ser Ser Gln
500

<210> 220

<211> 504

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (190)..(190)

<223> Xaa can be any naturally occurring amino acid

<400> 220

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Lys Ile Asp Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Ala Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Xaa Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Thr Ala Ser Ala Ala Ile Met Met Gln Arg Gly Asn Phe

370 375 380

Lys Asn Gln Arg Lys Ile Ile Lys Cys Phe Asn Cys Gly Arg Glu Gly

385 390 395 400

His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Ala Pro Pro Glu

450 455 460

Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Cys Gln Lys Gln

465 470 475 480

Glu Pro Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu

485 490 495

Phe Gly Asn Asp Pro Ser Ser Gln

500

<210> 221

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<400> 221

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Ile Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Gly Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Thr Lys Val Gln Gln Ala Ala Ala Ala Ala Asn Ser Ser Gln Val Ser

115 120 125

Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln

130 135 140

Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu
145 150 155 160
Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu Ser Glu
165 170 175
Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly
180 185 190
His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala

195 200 205
Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala Pro
210 215 220
Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser
225 230 235 240
Asn Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile Pro
245 250 255
Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Met Gly Leu Asn Lys Ile

260 265 270
Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly Pro
275 280 285
Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg
290 295 300
Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu
305 310 315 320
Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu

325 330 335
Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val
340 345 350
Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln
355 360 365
Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Ile Arg Asn
370 375 380
Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile

385 390 395 400

Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415

Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe

450 455 460

Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp Lys

465 470 475 480

Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro

485 490 495

Ser Ser Gln

<210> 222

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (64)..(64)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (219)..(219)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (391)..(391)

<223> Xaa can be any naturally occurring amino acid

<400> 222

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Gly Gln Xaa

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His

130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Xaa Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Met Thr Asn Ser Thr Asn Ile Met Met Gln Arg Gly Asn Ile Arg

370 375 380

Asn Gln Lys Arg Thr Val Xaa Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Ser

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Lys Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 223

<211> 506

<212> PRT

<213> Human immunodeficiency virus

<400> 223

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Glu Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Asp Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Ser Ser Leu Gln Thr Gly Ser Glu Asp Leu Lys Ser Val Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Arg Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Arg Ala Gln Gln Ala Ala Ala Ala Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Ile Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Gly

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Arg Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Thr Asp Pro Thr Ala Pro

450 455 460

Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln

465 470 475 480

Lys Gln Glu Gln Thr Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg

485 490 495

Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505

<210> 224

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (23)..(23)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (61)..(61)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (188)..(188)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (281)..(281)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (363)..(363)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (370)..(370)

<223> Xaa can be any naturally occurring amino acid

<400> 224

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Xaa Gly Gly Lys Lys Gln Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ala Ala Gly Cys Arg Gln Ile Xaa Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Gln Val Ser Asp

85 90 95
Thr Lys Glu Ala Leu Asp Arg Ile Glu Glu Glu Gln Asn Lys Ile Lys
100 105 110
Lys Lys Ala Gln Gln Glu Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Pro Met Ser Ala Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Xaa Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Ile Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile
245 250 255
Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Xaa Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Xaa Ala Glu Ala Met Ser

355 360 365

Gln Xaa Thr Asn Ser Ala Thr Val Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Arg Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Gly Ala Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro Glu Glu

450 455 460

Ser Phe Arg Phe Gly Glu Gly Thr Thr Thr Pro Ser Gln Lys Gln Glu

465 470 475 480

Pro Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe

485 490 495

Gly Asn Asp Pro Ser Ser Gln

500

<210> 225

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (472)..(472)

<223> Xaa can be any naturally occurring amino acid

<400> 225

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Gln Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Ser Ser Ser Pro Ala

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270
Ile Val Arg Met Tyr Ser Pro Ile Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ser His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Ala Asn Ile Met Met Gln Lys Gly Asn Phe
370 375 380
Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400
His Met Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys
405 410 415
Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Asn Glu Arg Gln Ala
420 425 430
Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn
435 440 445
Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe

450 455 460

Arg Phe Gly Glu Glu Thr Thr Xaa Pro Ala Pro Lys Gln Glu Pro Ile

465 470 475 480

Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn

485 490 495

Asp Pro Ser Ser Gln

500

<210> 226

<211> 507

<212> PRT

<213> Human immunodeficiency virus

<400> 226

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Ile Gln Leu

50 55 60

Gln Pro Ser Leu Lys Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Asp Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Thr Gln Gln Ala Ala Ala Asp Ala Gly Asn Ser Asn Thr Gly

115 120 125

Asn Ser Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Val Gln

130 135 140

Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp

145 150 155 160

Val Lys Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met
165 170 175
Phe Thr Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met
180 185 190
Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Ile Leu Lys Glu

195 200 205
Thr Ile Asn Asp Glu Ala Ala Glu Trp Asp Arg Thr His Pro Val His
210 215 220
Ala Gly Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp
225 230 235 240
Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr
245 250 255
His Asn Pro Pro Ile Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile

260 265 270
Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu
275 280 285
Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg
290 295 300
Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn
305 310 315 320
Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys

325 330 335
Thr Ile Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met
340 345 350
Thr Ala Cys Gln Gly Val Gly Gly Pro Ala His Lys Ala Arg Val Leu
355 360 365
Ala Glu Ala Met Ser Gln Val Thr Asn Ser Thr Ser Ala His Ile Met
370 375 380
Met Gln Lys Gly Asn Phe Arg Asn Gln Arg Lys Asn Val Lys Cys Phe

385 390 395 400
Asn Cys Gly Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg

405 410 415

Arg Lys Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp

420 425 430

Cys Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His

435 440 445

Lys Gly Arg Pro Gly Asn Phe Pro Gln Ser Arg Leu Glu Pro Thr Ala

450 455 460

Pro Pro Glu Glu Ser Ile Arg Phe Gly Glu Glu Thr Thr Ala Pro Pro

465 470 475 480

Gln Lys Gln Glu Thr Thr Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu

485 490 495

Arg Ser Leu Phe Gly Ser Asp Pro Ser Leu Gln

500 505

<210> 227

<211> 494

<212> PRT

<213> Human immunodeficiency virus

<400> 227

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Glu Lys Leu Asp Lys Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Arg Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Lys Gln Ile Leu Ala Gln Leu

50 55 60

Gln Pro Ser Leu Pro Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Ala Ile Ala Val Leu Tyr Cys Val His Arg Gly Ile Glu Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Gln Ala Gln Gln Ala Ala Ala Asp Asn Ser Gln Val Ser Gln Asn
115 120 125

Phe Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His Gln Ala Ile
130 135 140
Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys Ala
145 150 155 160
Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu Gly Ala
165 170 175
Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His Gln
180 185 190

Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu
195 200 205
Trp Asp Arg Val His Pro Val His Ala Gly Pro Val Ala Pro Gly Gln
210 215 220
Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu
225 230 235 240
Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro Val Gly
245 250 255

Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg
260 265 270
Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu
275 280 285
Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu
290 295 300
Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val
305 310 315 320

Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro
325 330 335
Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly
340 345 350
Pro Gly His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser Gln Val Thr

355 360 365

Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg Gly Gln Arg

370 375 380

Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile Ala Lys

385 390 395 400

Asn Cys Lys Ala Pro Arg Arg Arg Gly Cys Trp Lys Cys Gly Lys Glu

405 410 415

Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe Leu Gly

420 425 430

Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu Gln Ser

435 440 445

Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu

450 455 460

Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Lys Asp Lys Glu Met

465 470 475 480

Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro

485 490

<210> 228

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 228

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Asn Glu Leu Glu Arg Phe Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Ile Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Asn Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Gly Thr Gly Asn Asn Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Asn Ser Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Pro Arg Lys Ala Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 229

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<400> 229

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Asp Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Pro Ala Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln

115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val

130 135 140

His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val

145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu

165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val

180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu

195 200 205

Glu Ala Ala Glu Trp Asp Arg Met His Pro Val His Ala Gly Pro Ile

210 215 220

Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr

225 230 235 240

Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Ala

245 250 255

Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln

275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys

325 330 335

Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Ser Gln Val Thr Asn Gln Thr Thr Ile Met Met Gln Arg Gly Asn Phe

370 375 380

Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Glu Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe

450 455 460

Arg Phe Gly Glu Glu Thr Ala Thr Pro Thr Gln Lys Gln Glu Pro Ile

465 470 475 480

Asp Lys Glu Met Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn

485 490 495

Asp Pro Leu Ser Gln

500

<210> 230

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 230

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Ala Val Ala Thr Leu Tyr Cys Val His Gln Asn Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Thr Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Pro Ala Ala Val Met Met Gln Arg Gly Asn Phe Lys

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Ala Ala Ala Pro Pro Gln Lys Gln Glu Pro Thr Asp
465 470 475 480
Lys Glu Leu Tyr Pro Phe Ser Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln
500

<210> 231
<211> 502
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (372)..(372)
<223> Xaa can be any naturally occurring amino acid

<400> 231
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Tyr Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Ile Arg Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser Ser
115 120 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140

Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160
Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala
165 170 175
Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205
Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro
210 215 220
Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240
Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro
245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu
260 265 270
Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg
275 280 285
Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
290 295 300
Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr
305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335
Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350
Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365
Met Asn Gln Xaa Thr Asn Ser Asn Thr Ile Met Met Gln Arg Gly Asn
370 375 380

Phe Arg Asn Gln Gly Lys Asn Ile Lys Cys Phe Asn Cys Gly Lys Val

385 390 395 400

Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser

450 455 460

Phe Arg Phe Gly Glu Gly Thr Ala Pro Pro Ala Pro Lys Gln Glu Gln

465 470 475 480

Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln

500

<210> 232

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 232

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Gly Ile Glu Ile Arg Asp

85 90 95

Thr Lys Glu Ala Leu Glu Arg Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Ala Ala Ala Ala Asp Thr Glu Ser Ser Arg Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Pro Val Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Pro Val
245 250 255

Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Lys Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Thr Ala Val Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Ser Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Arg Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Ser Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Ala Pro Pro Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 233

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<400

> 233

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Tyr Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Arg Ala Gln Pro Ala Ala Ala Ala Asp Thr Gly Asn Asn Ser Asn
115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ser Gln Gly Gln Met Val
130 135 140
His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile
145 150 155 160
Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu
165 170 175
Ser Glu Gly Ala Thr Pro His Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Asp
195 200 205
Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile
210 215 220
Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
225 230 235 240
Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Thr Thr Asn Asn Pro Pro
245 250 255

Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn
260 265 270
Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln
275 280 285
Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu
305 310 315 320

Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Arg
325 330 335

Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln
340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met
355 360 365

Ser Gln Val Thr Asn Ala Asn Ala Ile Met Ile Gln Arg Gly Asn Phe
370 375 380

Lys Gly Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly
385 390 395 400

His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys
405 410 415

Cys Gly Gln Glu Gly His Gln Met Lys Asp Cys Asn Glu Arg Gln Ala
420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn
435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Lys Ser Leu
450 455 460

Arg Phe Gly Glu Gly Thr Thr Pro Pro Ser Gln Lys Gln Glu Pro Ile
465 470 475 480

Asp Lys Glu Met Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn
485 490 495

Asp Pro Ser Ser Gln
500

<210> 234

<211> 512

<212> PRT

<213> Human immunodeficiency virus

<400> 234

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Ala Ile Ala Val Leu Tyr Cys Val His Gln Asn Ile Glu Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys
100 105 110

Lys Lys Thr Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Gly Asn Thr
115 120 125

Gly Asn Ser Ser His Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu
130 135 140

Gln Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala
145 150 155 160

Trp Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro
165 170 175

Met Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr
180 185 190

Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys
195 200 205

Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val
210 215 220

His Ala Gly Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser
225 230 235 240

Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met

245 250 255

Thr Asn Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile
260 265 270

Ile Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile
275 280 285

Leu Asp Ile Lys Gln Gly Pro Lys Glu Ser Phe Arg Asp Tyr Val Asp
290 295 300

Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys
305 310 315 320

Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys
325 330 335

Lys Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met
340 345 350

Met Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val
355 360 365

Leu Ala Glu Ala Met Ser Gln Val Thr Asn Ser Thr Ala Ile Met Met
370 375 380

Gln Lys Gly Asn Phe Lys Asn Gln Arg Lys Thr Ile Lys Cys Phe Asn
385 390 395 400

Cys Gly Lys Glu Gly His Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys
405 410 415

Lys Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys
420 425 430

Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys
435 440 445

Gly Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro
450 455 460

Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu
465 470 475 480

Thr Ala Thr Pro Pro Gln Gly Gln Arg Gln Thr Asp Lys Asp Leu Tyr
485 490 495

Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505 510

<210> 235
<211> 499
<212> PRT
<213> Human immunodeficiency virus
<400> 235
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Val Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Val Lys
100 105 110
Lys Lys Thr Gln Gln Ala Ala Ala Asp Thr Glu Ser Lys Ser Pro Val

115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ala
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile

245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Arg Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320
Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Gly
355 360 365
Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380
Asn Lys Lys Ile Val Lys Cys Phe Asn Cys Gly Arg Glu Gly His Ile
385 390 395 400
Ala Arg Asn Cys Lys Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys Gly
405 410 415
Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe
420 425 430
Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe

450 455 460

Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Thr Val Asp Lys

465 470 475 480

Glu His Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro

485 490 495

Ser Ser Gln

<210> 236

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 236

Met Gly Ala Gly Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Val Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Phe Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Gly Ala Gly Thr Gly Thr Ser Ser

115 120 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met

130 135 140

Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160
Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala
165 170 175
Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr

180 185 190
Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205
Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro
210 215 220
Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240
Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro

245 250 255
Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu
260 265 270
Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg
275 280 285
Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
290 295 300
Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr

305 310 315 320
Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335
Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350
Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365
Met Ser His Val Thr Asn Ala Asn Thr Ile Met Met Gln Arg Gly Asn

370 375 380
Phe Lys Asn Gln Lys Lys Val Val Lys Cys Phe Asn Cys Gly Lys Glu

385 390 395 400

Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp

405 410 415

Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser

450 455 460

Phe Gly Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro

465 470 475 480

Ile Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly

485 490 495

Ser Asp Pro Ser Ser Gln

500

<210> 237

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<400> 237

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Gln Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Tyr Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Lys Gln Ile Ile Ala Gln Leu

50 55 60

Gln Pro Ser Ile Pro Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Ala Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Asp Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Met Thr Gly Ser Ala Thr Val Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Asn Asn Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe

450 455 460

Arg Phe Gly Glu Glu Thr Ala Thr Pro Pro Gln Lys Gln Glu Pro Arg

465 470 475 480

Asp Lys Asp Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn

485 490 495

Asp Pro Ser Ser Gln

500

<210

> 238

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 238

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gly Thr Gly Thr Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Ala Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Thr Gln Gln Ala Glu Ala Asp Thr Gly Asn Arg Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Pro Ile Ala Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Asp Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Thr Thr Val Met Val Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 239

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 239

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Arg Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Ser Asn Ser Lys Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Pro Met Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Met His Pro Val His Ala Gly Pro Val Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Ser Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Thr Asn Ile Met Met Gln Arg Gly Asn Phe Arg Asn

370 375 380

Gln Arg Gln Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile

385 390 395 400

Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys Gly

405 410 415

Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser Asn Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro Glu Glu Ser

450 455 460

Phe Arg Phe Arg Gly Glu Thr Thr Thr Pro Pro Gln Arg Gln Glu Pro

465 470 475 480

Thr Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln

500

<210> 240

<211> 497

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (193)..(193)

<223> Xaa can be any naturally occurring amino acid

<400> 240

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

His Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ala Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Gln Val Ser

115 120 125

Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His Gln

130 135 140

Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu

145 150 155 160

Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu

165 170 175

Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly

180 185 190

Xaa Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala

195 200 205

Ala Asp Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala Pro

210 215 220

Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser

225 230 235 240

Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile Pro

245 250 255

Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile

260 265 270

Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly Pro

275 280 285

Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg

290 295 300

Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr Leu

305 310 315 320

Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu

325 330 335

Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val

340 345 350

Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln

355 360 365

Ala Thr Gly Pro Ala Ala Ile Met Met Gln Arg Gly Asn Phe Arg Gly

370 375 380

Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile

385 390 395 400

Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys Gly

405 410 415

Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Pro

435 440 445

Gln Asn Arg Leu Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg Glu

450 455 460

Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp Lys Glu Leu

465 470 475 480

Tyr Pro Ile Pro Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser Ser

485 490 495

Gln

<210> 241

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 241

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Ser Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Asn Ser
115 120 125
Gln Ile Ser Gln Asn Tyr Pro Ile Val Gln Asn Val Gln Gly Gln Met
130 135 140
Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160
Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala
165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
180 185 190
Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205
Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro
210 215 220
Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro
245 250 255
Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu
260 265 270
Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys
275 280 285
Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
290 295 300

Thr Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr
305 310 315 320
Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335
Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365

Met Ser Gln Val Thr Asn Ser Thr Ala Thr Ala Met Met Gln Arg Gly
370 375 380
Asn Phe Arg Asn Gln Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Ala
385 390 395 400
Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp
405 410 415
Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln
420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly
435 440 445
Asn Phe Leu Gln Asn Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser
450 455 460
Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro
465 470 475 480
Lys Asp Lys Asp Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly
485 490 495

Asn Asp Pro Ser Ser Gln
500

<210> 242
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<400> 242
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Ile Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Asp Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Gly Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Ala Thr Asn Thr Val Ala Ile Met Met Gln Arg Gly Asn Phe Lys
370 375 380
Asn Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Arg Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Asn Arg Pro Glu Pro Ser Ala Pro Pro Ala Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480
Lys Asp Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 243
<211> 497
<212> PRT
<213> Human immunodeficiency virus

<400> 243

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Gln Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Ala Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Ser Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Cys
355 360 365

Gln Val Thr Asn Pro Ala Thr Val Met Met Gln Arg Gly Asn Leu Lys
370 375 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Lys
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Gly Thr Ile Asp
465 470 475 480
Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Gln

<210> 244

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 244

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Ser Tyr Gln Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

His Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Lys Gln Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Gln Ala Ala Ala Gly Thr Gly Ser Ser Ser

115 120 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140

Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala
165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn

195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Ala His Ala Gly Pro

210 215 220

Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro

245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Met Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Ala Thr Asn Ser Ala Ala Ile Met Met Gln Arg Gly Asn

370 375 380

Tyr Lys Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu

385 390 395 400

Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser

450 455 460

Phe Arg Phe Gly Glu Glu Thr Thr Ala Pro Ser Gln Lys Gln Glu Pro

465 470 475 480

Thr Asp Lys Glu Met Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln

500

<210> 245

<211> 508

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (283)..(283)

<223> Xaa can be any naturally occurring amino acid

<400> 245

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Glu Leu Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Val Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Gln Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Val Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser Ser

115 120 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met

130 135 140

Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala

165 170 175

Leu Ser Asp Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn

195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro

210 215 220

Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro

245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Xaa Ile Leu Asp Ile Arg

275 280 285

Gln Gly Pro Lys Glu Ser Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Arg Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn

370 375 380

Phe Lys Asn Gln Lys Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu

385 390 395 400

Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser

450 455 460

Phe Arg Phe Gly Glu Gly Thr Thr Thr Pro Thr Gln Lys Thr Thr Pro

465 470 475 480

Ser Gln Glu Gln Glu Pro Ile Asp Lys Asp Leu Tyr Pro Leu Ala Ser

485 490 495

Leu Lys Ser Leu Phe Gly Ser Asp Pro Ser Ser Gln

500 505

<210> 246

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (108)..(108)

<223> Xaa can be any naturally occurring amino acid

<400> 246

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Ile Ala Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Xaa Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Gly Pro Gly Ser Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His

130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Val Gln Gly Gly Asn Phe Lys

370 375 380

Ser Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Thr Ile Asp

465 470 475 480

Lys Glu Gly Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 247

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (170)..(170)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (192)..(192)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (246)..(246)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (249)..(249)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (252)..(252)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (277)..(277)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (286)..(286)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (300)..(300)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (401)..(401)

<223> Xaa can be any naturally occurring amino acid

<400> 247

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Arg Tyr Lys Leu Lys
20 25 30
His Ile Ile Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser Asn
115 120 125
Gln Ala Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140
Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160
Ile Glu Glu Lys Ala Phe Ser Pro Glu Xaa Ile Pro Met Phe Ser Ala

165 170 175
Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Xaa
180 185 190
Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205
Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro
210 215 220
Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240
Thr Thr Ser Thr Leu Xaa Glu Gln Xaa Ala Trp Xaa Thr Asn Asn Pro
245 250 255
Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu

260 265 270

Asn Lys Ile Val Xaa Met Tyr Ser Pro Val Ser Ile Leu Xaa Ile Arg

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Xaa Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Val Asn Ser Thr Thr Ile Met Met Gln Lys Gly Lys Phe

370 375 380

Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

Xaa Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe

450 455 460

Gly Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Asp Gln Lys

465 470 475 480

Glu Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn

485 490 495

Asp Pro Leu Ser Gln

500

<210> 248

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (81)..(81)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (118)..(118)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (353)..(353)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (484)..(484)

<223> Xaa can be any naturally occurring amino acid

<400> 248

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Leu Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Xaa Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Asp Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Arg
100 105 110

Lys Lys Ala Gln Gln Xaa Ala Ala Asp Thr Gly Asn Asn Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Xaa Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Thr Asn Ser Asn Thr Ile Met Met Met Gln Arg Gly Asn Phe

370 375 380

Arg Asn Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe

450 455 460

Arg Phe Gly Lys Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile

465 470 475 480

Asp Lys Asp Xaa Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn

485 490 495

Asp Pro Ser Ser Gln

500

<210

> 249

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (462)..(462)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (469)..(469)

<223> Xaa can be any naturally occurring amino acid

<400> 249

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Val Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His
130 135 140
Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Thr Ala Met Val Gln Arg Ser Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Xaa Phe Arg
450 455 460
Phe Gly Glu Glu Xaa Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480

Lys Glu Leu His Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln
500
<210> 250

<211> 504

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (72)..(72)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (79)..(79)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (135)..(135)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (186)..(186)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (259)..(259)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (295)..(295)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (357)..(357)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (383)..(383)

<223> Xaa can be any naturally occurring amino acid

<400> 250

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Ala Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Met Gly Gln Leu

50 55 60

His Pro Ser Leu Gln Thr Gly Xaa Glu Glu Leu Lys Ser Leu Xaa Asn

65 70 75 80

Ala Ile Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Tyr Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Phe Pro Ile Xaa Gln Asn Ile Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Xaa Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro Pro Val

245 250 255

Pro Val Xaa Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Xaa Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Xaa His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser
355 360 365
Gln Ala Thr Asn Ser Val Ala Met Thr Met Met Gln Arg Gly Xaa Phe
370 375 380

Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly
385 390 395 400
His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys
405 410 415
Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala
420 425 430
Asn Phe Leu Gly Lys Ile Trp Pro Ser His Ser Gly Arg Pro Gly Asn
435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Val Pro Thr Ala Pro Pro Ala
450 455 460
Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln
465 470 475 480
Glu Pro Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu
485 490 495
Phe Gly Asn Asp Pro Ser Ser Gln
500

<210> 251
<211> 500
<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (86)..(86)

<223> Xaa can be any naturally occurring amino acid

<400> 251

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Leu Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Val Tyr Asn
65 70 75 80

Thr Ile Ala Thr Leu Xaa Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Arg Val Gln Gln Ala Ala Ala Ala Thr Gly Ile Ser Gly Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His
130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ala
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

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Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Ile Ala
    210                 215                 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225                 230                 235                 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
                245                 250                 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
            260                 265                 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
        275                 280                 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
    290                 295                 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305                 310                 315                 320
Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
                325                 330                 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
            340                 345                 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
        355                 360                 365

Gln Val Thr Asn Pro Ala Thr Ile Met Met Gln Arg Gly Asn Phe Lys
    370                 375                 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Arg Glu Gly His
385                 390                 395                 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
                405                 410                 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
            420                 425                 430

Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe
        435                 440                 445
Pro Gln Ser Arg Leu Glu Pro Thr Ala Pro Pro Glu Glu Ser Leu Arg
```

450 455 460

Phe Gly Glu Glu Thr Ala Thr Pro His Gln Lys Gln Glu Pro Ile Asp
465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 252

<211> 497

<212> PRT

<213> Human immunodeficiency virus

<400> 252

Met Gly Ala Arg Ala Ser Val Leu Ser Ala Gly Glu Leu Asp Asn Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Lys Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Ser Asn Gln Val Ser Gln Asn
115 120 125

Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln Ala Ile
130 135 140

Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys Ala
145 150 155 160

Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu Gly Ala
165 170 175

Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His Gln
180 185 190
Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu
195 200 205
Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala Pro Gly Gln
210 215 220
Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu
225 230 235 240

Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro Val Gly
245 250 255
Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg
260 265 270
Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu
275 280 285
Ser Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu
290 295 300

Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val
305 310 315 320
Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro
325 330 335
Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly
340 345 350
Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Val Thr
355 360 365

Asn Pro Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg Asn Gln Arg
370 375 380
Lys Thr Val Lys Cys Phe Asn Cys Gly Arg Glu Gly His Ile Ala Lys
385 390 395 400
Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Lys Glu

405 410 415

Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe Leu Gly

420 425 430

Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu Gln Ser

435 440 445

Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu

450 455 460

Glu Ala Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp Lys Glu Leu

465 470 475 480

Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser Ser

485 490 495

Gln

<210> 253

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<400> 253

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Val Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Arg Ala Gln Gln Thr Ala Asp Thr Gly Lys Ser Ser Gln Val Ser

115 120 125

Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln

130 135 140

Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu

145 150 155 160

Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser Glu

165 170 175

Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly

180 185 190

His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala

195 200 205

Ala Asp Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala Pro

210 215 220

Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser

225 230 235 240

Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro

245 250 255

Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys Ile

260 265 270

Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly Pro

275 280 285

Lys Glu Ser Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg

290 295 300

Ala Glu Gln Cys Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr Leu

305 310 315 320

Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu

325 330 335

Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val

340 345 350

Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln

355 360 365

Val Thr Asn Ser Thr Thr Ile Met Met Gln Arg Gly Asn Phe Arg Ser

370 375 380

Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile

385 390 395 400

Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415

Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg Phe

450 455 460

Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp Arg

465 470 475 480

Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro

485 490 495

Ser Ser Gln

<210> 254

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (54)..(54)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (69)..(69)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (118)..(118)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (148)..(148)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (214)..(214)

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223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (252)..(252)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (268)..(268)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (300)..(300)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (478)..(478)

<223> Xaa can be any naturally occurring amino acid

<400> 254

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Xaa Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Xaa Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Xaa Ala Ala Gly Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Pro Leu Xaa Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Xaa Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Xaa Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Xaa Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Xaa Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Ser Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Arg Glu Gly His

385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Xaa Ile Asp
465 470 475 480
Lys Asp Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln
500

<210> 255
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (335)..(335)
<223> Xaa can be any naturally occurring amino acid

<400> 255
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

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His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
        35                  40                  45
Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
    50                  55                  60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65                  70                  75                  80
Thr Val Val Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
                85                  90                  95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys
            100                 105                 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Thr Gly Asn Ser
        115                 120                 125

Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln
    130                 135                 140
Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145                 150                 155                 160
Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser
                165                 170                 175
Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
            180                 185                 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
        195                 200                 205
Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly
    210                 215                 220
Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225                 230                 235                 240
Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn
                245                 250                 255

Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly
            260                 265                 270
Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile
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275 280 285

Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr

290 295 300

Arg Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met

305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Xaa Ile

325 330 335

Leu Lys Ala Leu Gly Gln Gly Ala Thr Leu Glu Glu Met Met Thr Ala

340 345 350

Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu

355 360 365

Ala Met Ser Gln Ala Thr Ser Val Asn Ile Met Met Gln Lys Gly Asn

370 375 380

Phe Arg Gly Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Arg Glu

385 390 395 400

Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Ser Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Arg Ile Trp Ser Ser His Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Asn Arg Thr Glu Pro Thr Ala Pro Pro Glu Glu Ile

450 455 460

Val Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Ser

465 470 475 480

Gly Glu Leu Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Leu

500

<210> 256

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220

><221> misc_feature

<222> (91)..(91)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (140)..(140)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (186)..(186)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (191)..(191)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (219)..(219)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (404)..(404)

<223> Xaa can be any naturally occurring amino acid

<400> 256

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Phe Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Ala Val Ala Thr Leu Tyr Cys Val His Gln Xaa Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Gln Lys Ala Lys Gln Ala Ala Ala Gly Pro Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Xaa Gln Met Val His
130 135 140
Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Xaa Met Leu Asn Thr Xaa Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val Xaa Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Leu Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Ser Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Ser Ser Ala Thr Val Met Met Gln Lys Gly Asn Phe Lys

370 375 380

Ser Gln Lys Arg Asn Ile Lys Cys Phe Asn Cys Gly Arg Glu Gly His

385 390 395 400

Leu Ala Arg Xaa Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Ser Arg Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Thr Lys Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 257

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (12)..(12)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (136)..(136)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (225)..(225)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (270)..(270)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (286)..(286)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (333)..(333)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (392)..(392)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (407)..(407)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (454)..(454)

<223> Xaa can be any naturally occurring amino acid

<400> 257

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Xaa Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Ala Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Arg Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Val Gln Gln Ala Thr Ala Asp Thr Gly Asn Ser Asn Ser Ser

115 120 125

Gln Val Ser Gln Asn Tyr Pro Xaa Val Gln Asn Leu Gln Gly Gln Met

130 135 140

Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala

165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn

195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro

210 215 220

Xaa Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro

245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Xaa Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Val Asn Ile Leu Xaa Ile Arg

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Xaa Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365

Met Ser Gln Val Thr Ser Ser Ala Thr Ile Met Met Gln Lys Gly Asn
370 375 380

Phe Lys Asn Gln Arg Lys Ala Xaa Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400

Gly His Ile Ala Arg Asn Xaa Arg Ala Pro Arg Lys Lys Gly Cys Trp
405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln
420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly
435 440 445

Asn Phe Leu Gln Ser Xaa Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser
450 455 460

Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro
465 470 475 480

Ile Asp Lys Asp Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly
485 490 495

Asn Asp Pro Ser Ser Gln
500

<210> 258

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 258

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Ile Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Lys Gln Ile Leu Glu Gln Leu

50 55 60

Gln Ser Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Lys Ser Ser Leu Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Ile Gln Lys Gly Asn Phe Arg
370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Lys Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460

Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Gly Thr Ile Asp
465 470 475 480

Lys Glu Leu Pro Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495

Pro Leu Ser Gln
500

<210> 259

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<220

><221> misc_feature

<222> (324)..(324)

<223> Xaa can be any naturally occurring amino acid

<400> 259

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Arg Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ser Ile Asn Pro
35 40 45

Asn Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val Gln Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Ala Lys Thr Gln Gln Ala Ala Ala Gly Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Ala Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Xaa Asn Ala Asn Pro Asp Cys Arg Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Gln Asn Ser Asn Ile Val Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Arg Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Ala Pro Ser Gln Lys Lys Glu Gln Gly Asp
465 470 475 480
Lys Asp Lys Asp Leu Tyr Pro Leu Asn Ser Leu Arg Ser Leu Phe Gly
485 490 495
Asn Asp Pro Leu Ser Gln
500

<210> 260
<211> 501
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (195)..(195)
<223> Xaa can be any naturally occurring amino acid
<400> 260
Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Leu
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30
His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45
Gly Leu Leu Glu Thr Ser Asp Gly Cys Lys Gln Ile Leu Ile Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110
Lys Lys Val Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Asn Ser
115 120 125
Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140

Val His Gln Ser Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160
Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala

165 170 175
Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
180 185 190
Val Gly Xaa His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205
Glu Glu Ala Ala Glu Trp Asp Arg Met His Pro Val His Ala Gly Pro
210 215 220
Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240
Thr Thr Ser Thr Leu Gln Glu Gln Val Ala Trp Met Thr Ser Asn Pro
245 250 255
Pro Val Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu
260 265 270
Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg
275 280 285
Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300
Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr
305 310 315 320
Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335
Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350
Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365
Met Ser Gln Val Thr Asn Pro Ala Asn Ile Met Met Gln Arg Gly Asn
370 375 380
Phe Lys Asn Gln Arg Arg Ile Val Lys Cys Phe Asn Cys Gly Lys Glu

385 390 395 400

Gly His Val Ala Lys His Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Val Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ile

450 455 460

Phe Arg Phe Gly Glu Glu Pro Thr Ala Pro Pro Gln Lys Gln Glu Ala

465 470 475 480

Arg Asp Glu Lys Tyr Pro Leu Thr Ala Leu Arg Ser Leu Phe Gly Asn

485 490 495

Asp Pro Ser Ser Gln

500

<210> 261

<211> 509

<212> PRT

<213> Human immunodeficiency virus

<400> 261

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Gln Gln Ala Ala Ala Ala Ala Ala Asp Thr

115 120 125

Gly Asn Ser Lys Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met

130 135 140

Gln Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala

145 150 155 160

Trp Val Lys Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro

165 170 175

Met Phe Thr Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr

180 185 190

Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys

195 200 205

Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Val His Pro Val

210 215 220

His Ala Gly Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser

225 230 235 240

Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Val Gly Trp Met

245 250 255

Thr Ser Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile

260 265 270

Ile Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile

275 280 285

Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp

290 295 300

Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys

305 310 315 320

Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys

325 330 335

Lys Thr Ile Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met

340 345 350

Met Thr Ala Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val

355 360 365

Leu Ala Glu Ala Met Ser Gln Ala Thr Asn Ala Ala Thr Ile Met Met

370 375 380

Gln Lys Gly Asn Phe Arg Asn Gln Arg Lys Pro Val Lys Cys Phe Asn

385 390 395 400

Cys Gly Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys

405 410 415

Arg Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys

420 425 430

Thr Glu Arg Gln Val Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys

435 440 445

Gly Arg Pro Gly Asn Phe Leu Gln Asn Arg Leu Glu Pro Thr Ala Pro

450 455 460

Ser Ala Pro Pro Ala Glu Ser Phe Gly Phe Gly Glu Glu Thr Ala Thr

465 470 475 480

Pro Pro Gln Lys Gln Glu Gln Ile Asp Lys Glu Leu Tyr Pro Leu Thr

485 490 495

Ser Leu Lys Ser Leu Phe Gly Asn Asp Leu Leu Ser Gln

500 505

<210> 262

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<400> 262

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Gln Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Arg Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Asn Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gly Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Thr Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Cys Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Arg Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Lys
370 375 380

Asn Gln Arg Lys Asn Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Arg Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Ser Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460

Leu Gly Glu Glu Thr Thr Pro Pro Gln Arg Arg Glu Ser Ile Asp Lys
465 470 475 480

Glu Lys Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro
485 490 495

Leu Ser Gln

<210> 263

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<400> 263

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Phe Arg Ser Leu Tyr Asn
65 70 75 80

Ala Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Thr Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Ala Ala Thr Gly Asn Ser
115 120 125

Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln
130 135 140

Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160

Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala
165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Leu Met Leu Asn
180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly
210 215 220

Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240

Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Ser Asn
245 250 255
Pro Pro Ile Gln Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly
260 265 270
Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile
275 280 285

Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300
Arg Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met
305 310 315 320
Thr Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile
325 330 335
Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350

Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu
355 360 365
Ala Met Ser Gln Val Thr Asn Pro Thr Thr Ile Met Met Gln Lys Gly
370 375 380
Asn Phe Arg Asn Gln Arg Arg Ser Ile Lys Cys Phe Asn Cys Gly Lys
385 390 395 400
Glu Gly His Thr Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys
405 410 415

Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg
420 425 430
Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro
435 440 445
Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Ala Glu
450 455 460
Ser Phe Gly Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu
465 470 475 480

Thr Val Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe

485 490 495

Gly Asn Asp Pro Ser Ser Gln

500

<210> 264

<211> 507

<212> PRT

<213> Human immunodeficiency virus

<400> 264

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Tyr Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Pro Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Val Gln Gln Glu Ala Ala Ala Ala Asp Thr Gly Asn Asn Asn

115 120 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln His

130 135 140

Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala

165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205
Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro
210 215 220

Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240
Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro
245 250 255
Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu
260 265 270
Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg
275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
290 295 300
Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr
305 310 315 320
Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Arg Asn Ile Leu
325 330 335
Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365
Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn
370 375 380
Phe Arg Asp Lys Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Arg Glu
385 390 395 400
Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp
405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln
420 425 430
Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Pro Ser

450 455 460

Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Pro Ala

465 470 475 480

Gln Lys Gln Glu Arg Thr Asp Arg Glu Leu Tyr Pro Leu Ala Ser Leu

485 490 495

Arg Ser Leu Phe Gly Asn Asp Pro Leu Ser Gln

500 505

<210> 265

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<400> 265

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Met Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Arg Thr Lys Ser Lys

100 105 110

Lys Lys Ala Gln Ala Gln Gln Ala Ala Ala Ala Asp Thr Gly Asn Ser

115 120 125

Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ala Gln Gly Gln

130 135 140

Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys

145 150 155 160

Val Val Glu Glu Lys Ala Phe Asn Pro Glu Val Ile Pro Met Phe Ala

165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn

180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Ile Leu Lys Glu Thr Ile

195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly

210 215 220

Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala

225 230 235 240

Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn

245 250 255

Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Met Gly

260 265 270

Leu Asn Lys Ile Val Lys Met Tyr Ser Pro Ile Ser Ile Leu Asp Ile

275 280 285

Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr

290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met

305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile

325 330 335

Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala

340 345 350

Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu

355 360 365

Ala Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly

370 375 380

Asn Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys

385 390 395 400

Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys

405 410 415

Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg

420 425 430

Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro

435 440 445

Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu

450 455 460

Ser Phe Arg Phe Gly Glu Glu Thr Ala Thr Pro Pro Gln Lys Gln Glu

465 470 475 480

Gln Thr Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe

485 490 495

Gly Asn Asp Pro Ser Ser Gln

500

<210> 266

<211> 497

<212> PRT

<213> Human immunodeficiency virus

<400> 266

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Gln Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Asn Lys Arg Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Lys Gln Leu

50 55 60

His Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Gln Cys Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Gly Thr Gly Ser Ser Ser Gln Ala

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Ala Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Met His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Ser Ser Ala Ala Ile Met Met Gln Arg Gly Asn Phe Gly

370 375 380

Asp Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Arg Glu Gly His

385 390 395 400

Val Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Gly Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ala His Arg Asp Arg Pro Gly Asn Phe

435 440 445

Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Gly Lys Glu Asp

465 470 475 480

Lys Glu Leu Tyr Pro Ser Thr Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro

<210> 267

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 267

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Lys Leu

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

```
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
        35                  40                  45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
    50                  55                  60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65                  70                  75                  80
Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp
                85                  90                  95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Thr Lys Ser Lys
            100                 105                 110
Lys Lys Thr Gln Gln Ala Ala Ala Asp Thr Gly Asn Asn Ser Gln Val
        115                 120                 125
Lys Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
    130                 135                 140
Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145                 150                 155                 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala
                165                 170                 175
Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
            180                 185                 190
Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
        195                 200                 205
Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro
    210                 215                 220

Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225                 230                 235                 240
Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro
                245                 250                 255
Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu
            260                 265                 270
Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg
```

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
290 295 300
Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr
305 310 315 320
Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335
Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350

Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365
Met Ser Gln Ala Thr Asn Ser Asn Thr Ile Met Met Gln Arg Gly Asn
370 375 380
Phe Arg Asn Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400
Gly His Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp
405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Ile Glu Arg Gln
420 425 430
Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly
435 440 445
Asn Phe Pro Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser
450 455 460
Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Pro Lys Gln Glu Pro
465 470 475 480

Ile Asp Lys Gly Leu Tyr Pro Ser Val Ser Leu Lys Ser Leu Phe Gly
485 490 495
Asn Asp Pro Leu Ser Gln
500

<210> 268
<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 268

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Thr Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Thr Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Met Gln Ser Lys Ser Lys
100 105 110

Lys Pro Thr Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Arg Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Ile Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala
210 215 220

Pro Gly Gln Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile
245 250 255
Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Thr Ala Val Met Met Gln Arg Gly Asn Phe Lys
370 375 380
Asn Gln Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Arg Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Lys Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Gly
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Gln Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 269

<211> 508

<212> PRT

<213> Human immunodeficiency virus

<400> 269

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Ala Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Gln Phe Lys
20 25 30

His Ile Ile Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Thr Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Ile Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser
115 120 125

Ser Thr Gly Asn Asn Ser Lys Val Ser Gln Asn Tyr Pro Ile Val Gln
130 135 140

Asn Leu Gln Gly Gln Met Val His Gln Pro Ile Ser Pro Arg Thr Leu
145 150 155 160

Asn Ala Trp Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val

165 170 175

Ile Pro Met Phe Thr Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu

180 185 190

Asn Thr Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met

195 200 205

Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His

210 215 220

Pro Val Gln Ala Gly Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg

225 230 235 240

Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly

245 250 255

Trp Met Thr Ser Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg

260 265 270

Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr

275 280 285

Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr

290 295 300

Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu

305 310 315 320

Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro

325 330 335

Asp Cys Arg Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu

340 345 350

Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala

355 360 365

Arg Val Leu Ala Glu Ala Met Ser Gln Val Thr Asn Ser Asn Thr Val

370 375 380

Met Met Gln Lys Gly Asn Phe Lys Asn Gln Arg Lys Thr Val Lys Cys

385 390 395 400

Phe Asn Cys Gly Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro

405 410 415

Arg Lys Arg Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys
420 425 430
Asp Cys Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser
435 440 445
His Lys Gly Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser
450 455 460
Ala Pro Pro Ala Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro
465 470 475 480

Pro Gln Lys Gln Glu Pro Met Asp Lys Glu Leu Tyr Pro Leu Ala Ser
485 490 495
Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 270
<211> 504
<212> PRT
<213> Human immunodeficiency virus
<400> 270
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Arg Leu Lys

20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Asn Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Arg Asp

85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Thr Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser Ser

115 120 125

Gln Gly Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln

130 135 140

Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys

145 150 155 160

Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser

165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn

180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile

195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly

210 215 220

Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala

225 230 235 240

Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn

245 250 255

Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly

260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile

275 280 285

Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr

290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met

305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile

325 330 335

Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala

340 345 350

Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu

355 360 365

Ala Met Ser Gln Ala Thr Gly Ala Ala Thr Ile Leu Met Gln Arg Gly
370 375 380
Asn Phe Arg Asn Gln Arg Lys Asn Val Lys Cys Phe Asn Cys Gly Lys
385 390 395 400
Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys

405 410 415
Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg
420 425 430
Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro
435 440 445
Gly Asn Phe Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu
450 455 460
Ser Phe Arg Phe Gly Glu Glu Thr Met Thr Pro Pro Gln Lys Lys Gln

465 470 475 480
Glu Pro Thr Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu
485 490 495
Phe Gly Asn Asp Pro Ser Ser Gln
500

<210> 271
<211> 505
<212> PRT
<213> Human immunodeficiency virus
<400> 271
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Asp Leu Asp Lys Trp
1 5 10 15
Glu Arg Ile Arg Leu Arg Pro Gly Gly Arg Lys Lys Tyr Gln Leu Lys

20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Thr Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asn Thr Gly Ala Ala Ala Ala Thr

115 120 125

Gly Thr Ser Ser Gln Asp Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu

130 135 140

Gln Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala

145 150 155 160

Trp Val Lys Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro

165 170 175

Met Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr

180 185 190

Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys

195 200 205

Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val

210 215 220

His Ala Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser

225 230 235 240

Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met

245 250 255

Thr Asn Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile

260 265 270

Ile Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile

275 280 285

Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp

290 295 300

Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys

305 310 315 320

Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys
325 330 335
Lys Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met

340 345 350
Met Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val
355 360 365
Leu Ala Glu Ala Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met
370 375 380
Gln Arg Gly Asn Phe Arg Ser Gln Arg Lys Ile Val Lys Cys Phe Asn
385 390 395 400
Cys Gly Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys

405 410 415
Lys Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys
420 425 430
Thr Asn Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His
435 440 445
Lys Gly Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala
450 455 460
Pro Pro Ala Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Ala Thr Ala

465 470 475 480
Pro Pro Gln Lys Gln Glu Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser
485 490 495
Leu Phe Gly Asn Asp Pro Leu Ser Gln
500 505

<210> 272
<211> 505
<212> PRT
<213> Human immunodeficiency virus
<400> 272
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Lys Tyr His Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Thr Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Gly Val Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Ala Gly Asn Ser Ser Ser Gln

115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val

130 135 140

His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val

145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu

165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val

180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu

195 200 205

Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile

210 215 220

Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr

225 230 235 240

Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro

245 250 255

Ile Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln

275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Val

290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys

325 330 335

Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Cys Leu Val Thr Ser Pro Ala Thr Ile Met Met Gln Lys Gly Asn Phe

370 375 380

Arg Asn Gln Arg Arg Pro Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys

405 410 415

Cys Gly Gln Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Leu Trp Pro Ser His Arg Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe

450 455 460

Arg Phe Gly Glu Glu Thr Ile Thr Pro Ser Gln Lys Gln Glu Pro Pro

465 470 475 480

Gln Lys Gln Glu Pro Glu Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser

485 490 495

Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505

<210> 273

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<400> 273

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Thr Asn Val Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Leu Arg

450 455 460

Phe Gly Glu Glu Thr Thr Pro Ser Gln Lys Gln Gly Thr Ile Asp Lys

465 470 475 480

Glu Leu Tyr Pro Trp Thr Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro

485 490 495

Ser Ser Gln

<210> 274

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 274

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Lys Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Asp Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Gly Thr Gly Asn Ser Ser Ser Ser

115 120 125

Gln Ala Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met

130 135 140

Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala

165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn

195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro

210 215 220

Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro

245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn

370 375 380

Phe Arg Asn Gln Lys Lys Met Val Lys Cys Phe Asn Cys Gly Lys Glu

385 390 395 400

Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp

405 410 415

Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser

450 455 460

Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro

465 470 475 480

Ile Asp Lys Glu Met Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln

500

<210> 275

<211> 498

<212> PRT

<213> Human immunodeficiency virus

<400> 275

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Arg Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Asn Ile Asp Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asp Ser Ser Lys Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Ile Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Asp Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala

210 215 220
Pro Gly Gln Ile Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Gln Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Asn Ile Met Met Gln Arg Gly Asn Phe Lys

370 375 380

Asn Gln Arg Arg Ile Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ser Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Glu Glu Thr Thr Thr Leu Ser Gln Lys Gln Glu Pro Ile Asp Lys Glu

465 470 475 480

Met Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Leu

485 490 495

Ser Gln

<210> 276

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 276

Met Gly Ala Arg Ala Ser Val Leu Arg Gly Glu Lys Leu Asp Asp Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Asn Lys Lys Tyr Gln Leu Arg

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Ala Gly Cys Arg Gln Ile Ile Thr Gln Leu
50 55 60
Gln Pro Ser Ile Gln Thr Gly Ser Glu Glu Ile Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Glu Arg Ile Lys Val Ala Asp
85 90 95

Thr Lys Glu Ala Leu Asp Arg Ile Glu Glu Glu Gln Ala Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Thr Ala Asp Ala Lys Asp Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Ala Gln Ala Gly Pro Val Ala
210 215 220

Pro Gly Gln Ile Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Thr Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Met Gly Pro Gly Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Thr Gly Ala Ala Met Met Met Gln Arg Gly Asn Phe

370 375 380

Lys Gly Pro Lys Arg Ile Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Arg Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Asn Arg Leu Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe

450 455 460

Gly Phe Gly Glu Glu Ile Val Pro Ser Gln Lys Gln Glu Gln Lys Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Met Ser Gln

500

<210> 277

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<400> 277

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Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1               5                  10                  15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
            20                  25                  30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
        35                  40                  45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Lys Ile Leu Gly Gln Leu
    50                  55                  60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65                  70                  75                  80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
                85                  90                  95

Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
            100                 105                 110
Lys Lys Ala Gln Gln Glu Ala Ala Ala Asp Thr Arg Asn Arg Ser Gln
        115                 120                 125
Val Ser Gln Asn Phe Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val
    130                 135                 140
His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val
145                 150                 155                 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu
                165                 170                 175
Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Val Met Leu Asn Thr Val
            180                 185                 190
Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Asp
        195                 200                 205
Glu Ile Ala Asp Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro His
    210                 215                 220

Pro Ala Gly Gln Leu Arg Glu Pro Arg Gly Thr Asp Ile Ala Gly Thr
225                 230                 235                 240
Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro Pro
```

245 250 255

Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln

275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Val

290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Ser Ile Leu Lys

325 330 335

Ala Leu Gly Pro Ala Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Ser Gln Ala Asn Ser Asn Thr Ile Met Met Gln Arg Gly Asn Phe Lys

370 375 380

Asn Gln Arg Arg Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro Glu Glu

450 455 460

Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu

465 470 475 480

Pro Arg Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe

485 490 495

Gly Asn Asp Pro Ser Ser Gln
500

<210> 278

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<400> 278

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Lys Leu Asp His Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

His Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Pro Val Ala Ala Asp Thr Gly Ser Asn Ser Lys Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Asn Ser Asn Asn Ile Met Met Gln Arg Gly Asn Phe Arg Asp

370 375 380

Gln Arg Lys Lys Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile

385 390 395 400

Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415

Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe
450 455 460
Gly Glu Glu Thr Thr Asn Pro Pro Gln Lys Gln Glu Pro Ile Asp Lys
465 470 475 480

Glu Leu Tyr Pro Ser Ile Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro
485 490 495
Ser Ser Gln

<210> 279
<211> 502
<212> PRT
<213> Human immunodeficiency virus
<400> 279
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Ala Gln Leu
50 55 60
Gln Pro Ala Leu Gln Thr Gly Thr Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Thr Ala Ala Ala Ala Asp Thr Gly Glu Ser Ser
115 120 125
Lys Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140
Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Ile Glu Glu Arg Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala
165 170 175
Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
180 185 190
Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205
Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro
210 215 220

Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240
Thr Thr Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro
245 250 255
Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu
260 265 270
Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg
275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
290 295 300
Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr
305 310 315 320
Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335
Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365
Met Ser Gln Val Thr Asn Ser Ala Asn Ile Met Met Gln Arg Gly Asn
370 375 380
Phe Arg Asn Gln Arg Lys Ala Val Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400

Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp
405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln
420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly
435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser
450 455 460

Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro
465 470 475 480

Ile Asp Lys Glu Met Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly
485 490 495

Asn Asp Pro Ser Ser Gln
500

<210> 280
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<400> 280

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Trp Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Val Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Ala Gln Gln Ala Ala Ala Gly Thr Gly Asn Ser Ser Gln
115 120 125
Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val
130 135 140
His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile
145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu
165 170 175
Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190
Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu
195 200 205
Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile
210 215 220

Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
225 230 235 240
Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro
245 250 255
Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn
260 265 270
Lys Ile Val Arg Met Tyr Ser Pro Ile Ser Ile Leu Asp Ile Lys Gln
275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr
290 295 300
Leu Arg Ala Glu Gln Cys Thr Gln Glu Val Lys Asn Trp Met Thr Glu
305 310 315 320
Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys
325 330 335
Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met
355 360 365
Ser Gln Val Asn Ser Thr Thr Ile Met Met Gln Arg Gly Asn Phe Lys
370 375 380
Asn Gln Arg Lys Asn Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415

Gly Glu Glu Gly His Gln Met Lys Asp Cys Thr Gly Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Thr Asp
465 470 475 480

Lys Glu Met Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln
500

<210> 281
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<400> 281
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

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        35                  40                  45
Gly Leu Leu Glu Thr Ser Ala Gly Cys Arg Gln Ile Leu Glu Gln Leu
    50                  55                  60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu His Asn
65                  70                  75                  80
Ala Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
                85                  90                  95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Arg Asn Lys Ser Lys
            100                 105                 110
Lys Lys Glu Gln Gln Ala Thr Ala Asp Thr Gly Asn Ser Asn Gln Val
        115                 120                 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
    130                 135                 140
Gln Thr Met Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145                 150                 155                 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
                165                 170                 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
            180                 185                 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
        195                 200                 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala
    210                 215                 220

Pro Gly Gln Leu Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225                 230                 235                 240
Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro Pro Ile
                245                 250                 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
            260                 265                 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
        275                 280                 285
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Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Ile Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Ala Thr Gly Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Lys
370 375 380

Asn Gln Arg Lys Ile Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Asn Phe Arg
450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Thr Asp
465 470 475 480

Lys Glu Gln Tyr Pro Leu Ala Ala Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 282

<211> 506

<212> PRT

<213> Human immunodeficiency virus

<400> 282

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Arg Trp
1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Ile Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Thr Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Met Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Asn Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn Phe
435 440 445
Pro Gln Ser Arg Leu Ala Pro Gln Ser Arg Leu Glu Pro Thr Ala Pro
450 455 460
Pro Glu Glu Ser Phe Arg Ile Gly Glu Glu Thr Ala Thr Pro Ser Gln
465 470 475 480

Lys Gln Glu Gln Ile Asp Arg Glu Met Pro Pro Leu Thr Ser Leu Arg

485 490 495

Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505

<210> 283

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<400> 283

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Ile Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Pro Gln Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Thr Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Ala Ser Gln Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg Asn
370 375 380
Gln Arg Arg Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile
385 390 395 400
Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly
405 410 415

Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe
420 425 430
Leu Gly Lys Ile Trp Pro Ser His Arg Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Asn Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg Phe

450 455 460

Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp Lys

465 470 475 480

Glu Leu Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro

485 490 495

Leu Ser Gln

<210> 284

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 284

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Tyr Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Arg Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Thr Glu Glu Ile Lys Ser Leu Tyr Asn

65 70 75 80

Ala Val Ala Thr Leu Tyr Cys Val His Gln Gly Ile Asp Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Glu Thr Gln Gln Ala Ala Ala Asp Thr Glu Asn Asn Ser Lys Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Asn Leu Gln Glu Gln Val Ala Trp Met Thr Gly Asn Pro Ala Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Arg Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Asn Ser Ala Asn Ala Asn Val Met Met Gln Arg Ser Asn Phe
370 375 380
Lys Asn Gln Arg Arg Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn

435 440 445

Phe Pro Gln Ser Arg Thr Glu Pro Thr Ala Pro Pro Glu Glu Ile Phe

450 455 460

Gly Phe Gly Glu Glu Ala Thr Pro Ser Gln Lys Gln Glu Ser Ile Asp

465 470 475 480

Lys Glu Lys Tyr Pro Leu Ser Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 285

<211> 506

<212> PRT

<213> Human immunodeficiency virus

<400> 285

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Gly Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Lys Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Lys Thr Gly Ser Glu Glu Ile Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Asn Lys Ile Glu Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser His Thr
115 120 125
Gly Asp Asn Ser Gln Val Ser His Asn Tyr Pro Ile Val Gln Asn Met
130 135 140
Gln Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala
145 150 155 160

Trp Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro
165 170 175
Met Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr
180 185 190
Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys
195 200 205
Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Val His Pro Val
210 215 220

His Ala Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser
225 230 235 240
Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met
245 250 255
Thr Asn Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile
260 265 270
Ile Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile
275 280 285

Leu Asp Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp
290 295 300
Arg Phe Tyr Lys Val Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys
305 310 315 320
Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys
325 330 335

Lys Thr Ile Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met
340 345 350

Met Thr Ala Cys Gln Gly Val Gly Gly Pro Ala His Lys Ala Arg Val
355 360 365
Leu Ala Glu Ala Met Ser Gln Ala Thr Asn Ala Ala Ala Ile Met Met
370 375 380
Gln Lys Gly Asn Tyr Gly Asn Gln Lys Lys Ile Val Lys Cys Phe Asn
385 390 395 400
Cys Gly Lys Ile Gly His Ile Ala Lys His Cys Lys Ala Pro Arg Lys
405 410 415

Arg Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys
420 425 430
Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys
435 440 445
Gly Arg Pro Gly Asn Phe Leu Gln Asn Arg Pro Glu Pro Ser Ala Pro
450 455 460
Pro Glu Glu Ser Phe Lys Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln
465 470 475 480

Lys Gln Glu Pro Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys
485 490 495
Ser Leu Phe Gly Asn Asp Pro Leu Ser Gln
500 505

<210> 286
<211> 501
<212> PRT
<213> Human immunodeficiency virus
<400> 286
Met Gly Ala Arg Ala Ser Ile Leu Arg Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

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His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
        35                  40                  45
Gly Leu Leu Glu Ser Ser Glu Gly Cys Arg Lys Ile Leu Glu Gln Leu
    50                  55                  60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65                  70                  75                  80
Thr Ile Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Ile Arg Asp
                85                  90                  95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
            100                 105                 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Lys Ser Gln Val
        115                 120                 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
    130                 135                 140
Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145                 150                 155                 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
                165                 170                 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
            180                 185                 190
Gly His Gln Ala Ala Met Gln Ile Leu Lys Glu Thr Ile Asn Glu Glu
        195                 200                 205
Ala Ala Asp Trp Asp Arg Thr His Pro Val His Ala Gly Pro Val Ala
    210                 215                 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225                 230                 235                 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
                245                 250                 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
            260                 265                 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
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275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Gly Ala Thr Leu Glu Asp Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Thr Asn Val Met Met Gln Arg Gly Asn Phe
370 375 380
Arg Ser Gln Arg Arg Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly
385 390 395 400
His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys
405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala
420 425 430
Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Glu Arg Pro Gly Asn
435 440 445
Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Ala Glu Ser Phe
450 455 460
Arg Phe Gly Glu Glu Thr Ala Thr Pro Pro Gln Lys Gln Glu Pro Ile
465 470 475 480

Asp Gln Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn
485 490 495
Asp Pro Ser Ser Gln
500

<210> 287
<211> 503

<212> PRT

<213> Human immunodeficiency virus

<400> 287

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Tyr Ser Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Thr Ala Ala Asp Thr Gly Asn Ser Ser Gln
115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val
130 135 140

His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val
145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu
165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu
195 200 205

Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile
210 215 220

Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
225 230 235 240
Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro
245 250 255
Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn
260 265 270
Lys Ile Val Arg Met Tyr Ser Pro Ile Ser Ile Leu Asp Ile Lys Gln
275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr
290 295 300
Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu
305 310 315 320
Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys
325 330 335
Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln
340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Ile Leu Ala Glu Ala Met
355 360 365
Ser Gln Val Thr Asn Ser Asn Val Ile Met Met Gln Arg Gly Asn Phe
370 375 380
Arg Asn Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly
385 390 395 400
His Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys
405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala
420 425 430
Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn
435 440 445
Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe
450 455 460
Arg Phe Gly Glu Glu Thr Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro

465 470 475 480

Val Asp Lys Glu Leu Tyr Pro Pro Leu Ala Ser Leu Arg Ser Leu Phe
485 490 495

Gly Asn Asp Pro Ser Ser Gln
500

<210> 288

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<400> 288

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly His Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Ile Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gln Lys Ser Ser Gln Val
115 120 125

Ser Gln Asn Phe Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Pro Val

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ser Ala Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Gly Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Gly Arg Pro Gly Asn
435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe
450 455 460

Arg Tyr Gly Glu Gly Thr Ile Ala Pro Pro Gln Lys Gln Glu Gln Ile
465 470 475 480

Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn
485 490 495

Asp Pro Ser Ser Gln
500

<210> 289
<211> 503
<212> PRT
<213> Human immunodeficiency virus
<400> 289

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser

115 120 125

Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln

130 135 140

Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys

145 150 155 160

Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser

165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn

180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile

195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly

210 215 220

Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala

225 230 235 240

Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn

245 250 255

Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly

260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile

275 280 285

Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr

290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met

305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile

325 330 335

Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala

340 345 350

Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu

355 360 365

Ala Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly
370 375 380
Asn Phe Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys
385 390 395 400
Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys
405 410 415

Trp Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg
420 425 430
Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro
435 440 445
Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu
450 455 460
Ser Phe Arg Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Glu
465 470 475 480

Pro Thr Asp Lys Glu Leu Tyr Pro Leu Val Ser Leu Lys Ser Leu Phe
485 490 495
Gly Asn Asp Pro Ser Ser Gln
500

<210> 290
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<400> 290
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ala Glu Gly Cys Lys Gln Ile Met Glu Gln Leu
50 55 60
Gln Pro Ala Leu Gln Thr Gly Thr Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Pro Ala Ala Asp Thr Gly Ser Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Lys Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Arg Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Ala Val Met Met Gln Lys Gly Asn Phe Lys
370 375 380
Asn Gln Arg Lys Ala Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Arg Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Val Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Ala Pro Pro Gln Lys Gln Glu Pro Thr Asp
465 470 475 480

Lys Glu Leu His Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln
500

<210> 291
<211> 507
<212> PRT
<213> Human immunodeficiency virus
<400> 291
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Ser Ala Gly Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Ala Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80
Met Val Ala Thr Leu Tyr Cys Val His Gln Gln Ile Glu Val Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Thr Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Lys Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
260 265 270

Val Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Ala Asn Ser Ala Ser Ile Met Met Gln Lys Gly Asn Phe Lys Asn
370 375 380
Gln Gly Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Ala Gly His Ile
385 390 395 400
Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly
405 410 415

Lys Glu Gly His Gln Met Lys Asp Cys Ser Asn Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Asn Arg Pro Glu Pro Ser Ala Pro Pro Glu Pro Ser Ala Pro
450 455 460
Pro Glu Glu Ser Phe Arg Phe Gly Glu Gly Thr Thr Thr Pro Ser Gln
465 470 475 480

Lys Gln Glu Thr Thr Asp Lys Asp Leu Tyr Pro Pro Leu Ala Ser Leu
485 490 495
Lys Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 292

<211> 496

<212> PRT

<213> Human immunodeficiency virus

<400> 292

Met Gly Ala Arg Ala Ser Ile Ile Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Ile Trp Ala Ser Arg Glu Leu Glu Arg Tyr Ala Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Ile Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Phe Arg Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Arg Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Pro Val Ser
115 120 125

Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln
130 135 140

Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu

145 150 155 160

Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu
165 170 175

Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly
180 185 190

His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala
195 200 205

Ala Glu Trp Asp Arg Leu His Pro Pro Gln Ala Gly Pro His Pro Pro

210 215 220

Gly Gln Leu Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser

225 230 235 240

Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro

245 250 255

Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile

260 265 270

Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly Pro

275 280 285

Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg

290 295 300

Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu

305 310 315 320

Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu

325 330 335

Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val

340 345 350

Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln

355 360 365

Val Thr Thr Pro Pro Ala Ile Met Met Gln Arg Gly Asn Phe Arg Asn

370 375 380

Gln Gly Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Val Gly His Ile

385 390 395 400

Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415

Lys Glu Gly His Gln Met Arg Asp Cys Ile Glu Gly Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg Phe

450 455 460

Gly Glu Glu Thr Ala Thr Pro Pro Gln Lys Gln Glu Ser Ile Asp Lys

465 470 475 480

Glu Lys Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro

485 490 495

<210> 293

<211> 506

<212> PRT

<213> Human immunodeficiency virus

<400> 293

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Gln Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Pro Ala Ala Ala Ala Ala Asp Thr Gly Asn Asn Ser

115 120 125

Asn Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met

130 135 140

Ile His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala

165 170 175

Leu Ala Glu Gly Ala Thr Pro Gly Asp Leu Asn Leu Met Leu Asn Ala
180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205

Glu Glu Ala Ala Asp Trp Asp Arg Gln His Pro Val Gln Ala Gly Pro
210 215 220

Val Ala Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Ala Asn Pro
245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu
260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg
275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr
305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335

Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365

Met Ser Gln Val Thr Asn Ser Thr Ala Ile Met Met Gln Arg Gly Asn
370 375 380

Phe Arg Asn Gln Arg Lys Ser Ile Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400

Gly His Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp
405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Thr

450 455 460

Ala Pro Pro Glu Glu Ser Phe Arg Phe Val Glu Glu Thr Thr Thr Pro

465 470 475 480

Ser Pro Lys Gln Glu Gln Arg Asp Lys Glu Leu Tyr Pro Pro Leu Ala

485 490 495

Ser Leu Arg Ser Leu Phe Gly Ser Asp Pro

500 505

<210> 294

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<400> 294

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Arg Ala Gln Gln Ala Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser

115 120 125

Ser Gln Val Ser His Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln
130 135 140
Met Val His Gln Pro Ile Ser Pro Arg Thr Phe Lys Ala Trp Val Lys
145 150 155 160

Val Ile Glu Glu Asn Val Phe Leu Phe Gly Leu Ile Pro Met Phe Thr
165 170 175
Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190
Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205
Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Ala Gln Ala Gly
210 215 220

Pro Ile Ala Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240
Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Thr Trp Met Thr Asn Asn
245 250 255
Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly
260 265 270
Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile
275 280 285

Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300
Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met
305 310 315 320
Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile
325 330 335
Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350

Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu
355 360 365
Ala Met Ser Gln Val Thr Asn Ser Ala Ala Ile Met Met Gln Lys Gly

370 375 380

Asn Phe Arg Asn Gln Arg Arg Ser Val Lys Cys Phe Asn Cys Gly Lys

385 390 395 400

Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys

405 410 415

Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg

420 425 430

Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro

435 440 445

Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu

450 455 460

Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu

465 470 475 480

Pro Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe

485 490 495

Gly Asn Asp Pro Ser Ser Gln

500

<210> 295

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 295

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro

35 40 45

Ser Leu Leu Glu Thr Ala Glu Gly Cys Lys Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu His Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Ala Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys
100 105 110
Lys Lys Ala Gln Gln Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser
115 120 125
Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Arg Asn Leu Gln Gly Gln
130 135 140
Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160

Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser
165 170 175
Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190
Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205
Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly
210 215 220

Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240
Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn
245 250 255
Pro Pro Ile Pro Val Gly Asp Ile Tyr Lys Gln Trp Ile Ile Met Gly
260 265 270
Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile
275 280 285

Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300
Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met
305 310 315 320
Thr Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile

325 330 335

Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350

Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu
355 360 365

Ala Met Ser Gln Val Thr Asn Ala Ala Thr Ile Met Met Gln Lys Gly
370 375 380

Asn Phe Arg Gly Gln Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Lys
385 390 395 400

Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys
405 410 415

Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg
420 425 430

Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro
435 440 445

Gly Asn Phe Leu Gln Asn Arg Pro Glu Pro Ser Ala Pro Pro Ala Glu
450 455 460

Ser Phe Arg Phe Gly Glu Glu Thr Ala Ala Pro Ser Gln Lys Gln Glu
465 470 475 480

Gln Ile Asp Lys Glu Leu Tyr Pro Thr Thr Ser Leu Arg Ser Leu Phe
485 490 495

Gly Asn Asp Pro Ser Leu
500

<210> 296

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<400> 296

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Gln Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Pro Ala Ala Ala Ala Ala Asp Thr Gly Asn Asn Ser
115 120 125
Asn Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140
Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala
165 170 175
Leu Ala Glu Gly Ala Thr Pro Gly Asp Leu Asn Leu Met Leu Asn Thr
180 185 190
Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205
Glu Glu Ala Ala Asp Trp Asp Arg Gln His Pro Val His Ala Gly Pro
210 215 220

Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240
Thr Thr Ser Thr Leu Gln Glu Gln Val Ala Trp Met Thr Ala Asn Pro
245 250 255
Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu
260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg
275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
290 295 300
Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr
305 310 315 320
Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335
Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365
Met Ser Gln Ile Thr Asn Pro Thr Ala Ile Met Met Gln Arg Gly Asn
370 375 380
Phe Lys Asn Gln Arg Lys Ile Ile Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400
Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp
405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Ile Glu Arg Gln
420 425 430
Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly
435 440 445
Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser
450 455 460
Phe Arg Phe Val Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro
465 470 475 480

Thr Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly
485 490 495
Asn Asp Pro

<210> 297

<211> 508

<212> PRT

<213> Human immunodeficiency virus

<400> 297

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Asp Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Gln Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Asn Gly Cys Arg Gln Ile Leu Ala Gln Leu
50 55 60

Gln Ser Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Ala Asp Thr Gly Asn Asn
115 120 125

Ser Gln Ile Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln
130 135 140

Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160

Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr
165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly

210 215 220

Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240
Gly Thr Thr Ser Thr Leu Gln Glu Gln Val Ala Trp Met Thr Gly Asn
245 250 255
Pro Gly Val Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Met Gly
260 265 270
Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile
275 280 285

Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300
Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met
305 310 315 320
Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile
325 330 335
Leu Lys Ala Met Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350

Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu
355 360 365
Ala Met Ser Gln Val Asn Ser Asn Ala Ile Met Met Gln Arg Gly Asn
370 375 380
Phe Arg Gly Gln Arg Arg Thr Val Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400
Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp
405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Asn Glu Arg
420 425 430
Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro
435 440 445
Gly Asn Phe Leu Gln Ser Arg Pro Gly Pro Thr Ala Leu Glu Pro Thr
450 455 460

Ala Pro Pro Glu Glu Ser Ile Arg Phe Gly Glu Gly Thr Thr Thr Ser
465 470 475 480

Ser Gln Lys Gln Glu Pro Arg Asp Lys Glu Leu Tyr Pro Leu Thr Ser
485 490 495
Leu Lys Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 298
<211> 510
<212> PRT
<213> Human immunodeficiency virus
<400> 298
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys

20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Ile Ala Thr Leu Tyr Cys Val His Gln Gly Ile Glu Ile Arg Asp

85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Glu Ala Gln Gln Ala Ala Ala Ala Thr Gly Asn Asn Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ala
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Ala Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350
Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Leu Ala Thr Asn Pro Ala Ala Ile Met Met Gln Lys Gly Asn Phe Lys
370 375 380
Ser Pro Arg Lys Gly Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Leu Arg

450 455 460

Pro Thr Ala Pro Pro Ala Glu Ser Leu Arg Phe Gly Glu Glu Thr Thr

465 470 475 480

Thr Pro Ser Gln Lys Gln Gly Thr Ile Asp Lys Glu Leu Tyr Pro Leu

485 490 495

Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505 510

<210> 299

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<400> 299

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Ile Gly Lys Asn Asn Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Thr Asn Thr Ala Ala Ser Ile Met Met Gln Arg Gly Asn Pro

370 375 380

Lys Thr Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Ile Gly

385 390 395 400

His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Asn Glu Gly Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe

450 455 460

Arg Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Glu Pro Lys

465 470 475 480

Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn

485 490 495

Asp Pro Ser Ser Gln

500

<210> 300

<211> 506

<212> PRT

<213> Human immunodeficiency virus

<400> 300

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Ala Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ala Leu Lys Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Gln Pro Ala Ala Ala Asp Thr Gly Asn Asn
115 120 125
Asn Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ala Gln Gly Gln
130 135 140

Met Val His Gln Gly Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160
Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser
165 170 175
Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190
Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile
195 200 205

Asn Glu Glu Ala Ala Asp Trp Asp Arg Met His Pro Val His Ala Gly
210 215 220
Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240
Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gln Trp Met Thr Asn Asn
245 250 255
Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Ile Gly
260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile
275 280 285
Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300
Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met

305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Ser Ile

325 330 335

Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala

340 345 350

Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu

355 360 365

Ala Met Ser Gln Val Thr Asn Ser Ala Ala Ile Met Met Gln Asn Ser

370 375 380

Asn Phe Lys Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys

385 390 395 400

Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys

405 410 415

Trp Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg

420 425 430

Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro

435 440 445

Gly Asn Phe Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro

450 455 460

Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Ala Ala Pro Ser Gln

465 470 475 480

Gln Gln Gly Thr Met Asp Lys Asp Leu Tyr Pro Leu Ala Ser Leu Lys

485 490 495

Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505

<210> 301

<211> 506

<212> PRT

<213> Human immunodeficiency virus

<400> 301

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Thr Gly Asn
115 120 125
Asn Ser Lys Val Ser Gln Asn Phe Pro Ile Val Gln Asn Leu Gln Gly
130 135 140

Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val
145 150 155 160
Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe
165 170 175
Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu
180 185 190
Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr
195 200 205

Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala
210 215 220
Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile
225 230 235 240
Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn
245 250 255

Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu
260 265 270

Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Gly Ile Leu Asp
275 280 285

Ile Arg Gln Gly Pro Lys Glu Ser Phe Arg Asp Tyr Val Asp Arg Phe
290 295 300

Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp
305 310 315 320

Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr
325 330 335

Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr
340 345 350

Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala
355 360 365

Glu Ala Met Ser His Val Thr Asn Pro Val Asn Ile Met Met Gln Arg
370 375 380

Gly Ser Phe Arg Asn Gln Arg Arg Met Val Lys Cys Phe Asn Cys Gly
385 390 395 400

Lys Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly
405 410 415

Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Asn Glu
420 425 430

Arg Gln Val Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg
435 440 445

Pro Gly Asn Phe Leu Gln Asn Arg Pro Glu Pro Ser Ala Pro Pro Ala
450 455 460

Glu Ser Leu Gly Phe Gly Glu Glu Ala Thr Thr Pro Pro Gln Lys Gln
465 470 475 480

Glu Thr Met Thr Val Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg
485 490 495

Ser Leu Phe Gly Ser Asp Pro Ser Ser Gln

500 505

<210> 302

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<400> 302

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

His Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Asn Ile Glu Val Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Asp Thr Gly Asn Ser Gly Gln
115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val
130 135 140

His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val
145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu
165 170 175

Ser Glu Gly Ala Thr Pro Gly Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu

195 200 205

Glu Ala Ala Glu Trp Asp Arg Thr His Pro Val His Ala Gly Pro Val
210 215 220
Ala Pro Gly Gln Leu Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
225 230 235 240
Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro Pro
245 250 255
Ile Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Leu Gly Leu Asn
260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile Lys Gln
275 280 285
Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr
290 295 300
Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu
305 310 315 320
Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys
325 330 335

Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln
340 345 350
Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met
355 360 365
Ser Gln Leu Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe
370 375 380
Arg Asn Gln Lys Arg Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly
385 390 395 400

His Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys
405 410 415
Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Ile Glu Arg Gln Ala
420 425 430
Asn Phe Leu Gly Arg Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn
435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Ala Glu Ser Phe
450 455 460

Gly Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Leu Ile
465 470 475 480
Asp Lys Glu Gln Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn
485 490 495
Asp Pro Ser Ser Met
500

<210> 303
<211> 502
<212> PRT
<213> Human immunodeficiency virus
<400> 303
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Gln Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Lys Arg Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Val Ala Ala Asp Ala Gly Thr Ser Asn
115 120 125
Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met
130 135 140

Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160
Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala
165 170 175
Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
180 185 190
Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro
210 215 220
Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240
Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro
245 250 255
Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu
260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys
275 280 285
Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
290 295 300
Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr
305 310 315 320
Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335

Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350
Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365
Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Thr Gly Lys
370 375 380
Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu

385 390 395 400

Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp
405 410 415
Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln
420 425 430
Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly
435 440 445
Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser
450 455 460

Phe Arg Phe Gly Glu Glu Ile Thr Thr Pro Ser Gln Lys Gln Glu Leu
465 470 475 480
Thr Asp Lys Glu Met Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly
485 490 495
Asn Asp Pro Ser Ser Gln
500

<210> 304
<211> 501
<212> PRT
<213> Human immunodeficiency virus
<400> 304
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Arg Gly Lys Lys Arg Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Ser Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Ala Val Ala Thr Leu Tyr Cys Val His Gln Asn Ile Glu Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Gly Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Ile Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Phe Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Leu Gln Lys Gly Asn Phe Arg
370 375 380

Asp Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Val Gly His
385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Asn Glu Gly Arg Gln
420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly
435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser
450 455 460

Phe Arg Phe Gly Glu Glu Thr Thr Pro Ser Gln Lys Gln Glu Lys Ile
465 470 475 480

Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn
485 490 495

Asp Pro Ser Ser Gln
500

<210> 305

<211> 506

<212> PRT

<213> Human immunodeficiency virus

<400> 305

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Asn Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Val Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

```
        35                  40                  45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
    50                  55                  60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65                  70                  75                  80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Ile Lys Asp
                85                  90                  95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
            100                 105                 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Arg Gly Asn Ser
        115                 120                 125
Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Glu Gly Gln
    130                 135                 140

Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145                 150                 155                 160
Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser
                165                 170                 175
Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
            180                 185                 190
Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
        195                 200                 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly
    210                 215                 220
Pro Ile Thr Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225                 230                 235                 240
Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn
                245                 250                 255
Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly
            260                 265                 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile
        275                 280                 285
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Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300
Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Arg Thr
305 310 315 320
Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile
325 330 335

Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350
Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu
355 360 365
Ala Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly
370 375 380
Asn Phe Arg Asn Gln Arg Lys Ile Ile Lys Cys Phe Asn Cys Gly Lys
385 390 395 400

Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys
405 410 415
Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg
420 425 430
Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Cys Lys Gly Arg Arg
435 440 445
Asn Phe Pro Gln Ser Arg Thr Glu Pro Thr Ala Pro Pro Glu Glu Ser
450 455 460

Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Tyr Gln Lys Gln Glu Lys
465 470 475 480
Lys Gln Glu Thr Ile Asp Lys Asp Leu Tyr Pro Leu Ala Ser Leu Lys
485 490 495
Ser Leu Phe Gly Asn Asp Pro Leu Ser Gln
500 505

<210> 306
<211> 500
<212> PRT
<213> Human immunodeficiency virus

<400> 306

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Arg Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Arg Arg Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Pro Ala Thr Ile Met Ile Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Lys Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480
Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Ser Asp

485 490 495

Pro Ser Ser Gln

500

<210> 307

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<400> 307

Met Gly Ala Arg Ala Ser Val Leu Ser Ala Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Ile Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Lys Gly Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Pro Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Pro Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Lys Lys Pro Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Leu Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro Glu Glu

450 455 460

Ser Phe Arg Phe Gly Glu Glu Thr Ile Thr Pro Ser Gln Lys Gln Glu

465 470 475 480

Ser Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe

485 490 495

Gly Asn Asp Pro Ser Ser Gln

500

<210> 308

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 308

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Pro Ala Ala Ala Asp Thr Gly Asn Ser Thr Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His

130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Ser Ser Ala Asn Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Arg Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480
Lys Glu Met Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln
500

<210> 309
<211> 503
<212> PRT
<213> Human immunodeficiency virus
<400> 309
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Gly Gln Val
115 120 125
Ser Gln Asn Phe Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Pro Ile Asn Glu Glu
195 200 205

Ala Ala Arg Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Ile Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ser His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro Glu Glu
450 455 460

Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu
465 470 475 480
Leu Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe
485 490 495
Gly Asn Asp Pro Ser Ser Gln
500

<210> 310
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<400> 310
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Glu Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Thr Ala Asp Ile Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Ser Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380

Asn Gln Lys Arg Thr Val Lys Cys Phe Asn Cys Gly Arg Glu Gly His
385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460

Phe Gly Glu Glu Ile Ala Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 311

<211> 498

<212> PRT

<213> Human immunodeficiency virus

<400> 311

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Thr Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu Gln Pro
50 55 60

Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn Thr Val
65 70 75 80

Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp Thr Lys
85 90 95

Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Gly Lys Lys Lys
100 105 110

Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Thr Val Ser Gln
115 120 125

Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His Gln Ala
130 135 140

Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys
145 150 155 160

Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu Gly
165 170 175

Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His
180 185 190

Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala
195 200 205

Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala Pro Gly
210 215 220

```
Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr
225                 230                 235                 240
Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile Pro Val
                245                 250                 255
Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys Ile Val
            260                 265                 270

Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys
        275                 280                 285
Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala
    290                 295                 300
Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr Leu Leu
305                 310                 315                 320
Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly
                325                 330                 335

Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly
            340                 345                 350
Gly Pro Ser His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser Gln Val
        355                 360                 365
Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Val Arg Asn Gln
    370                 375                 380
Arg Lys Ala Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile Ala
385                 390                 395                 400

Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Lys
                405                 410                 415
Glu Gly His Gln Met Lys Asp Cys Ile Glu Arg Gln Ala Asn Phe Leu
            420                 425                 430
Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe Leu Gln
        435                 440                 445
Ser Arg Pro Glu Pro Ser Ala Pro Pro Asp Glu Ser Phe Gly Phe Gly
    450                 455                 460

Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp Lys Glu
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465 470 475 480

Lys Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser

485 490 495

Ser Gln

<210> 312

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 312

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Lys Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Gly Ile Glu Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Arg Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Arg Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Thr Val Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Leu Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 313

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 313

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Phe Tyr Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Lys Gly Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 314

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 314

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Asn Ile Asp Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Ala Glu Lys Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Arg Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 315

<211> 504

<212> PRT

<213> Human immunodeficiency virus

<400> 315

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Ser Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Lys Thr Gly Ser Glu Glu Leu Thr Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Thr Lys Ser Met

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Pro Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Asn Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Glu Gln Lys Gln

465 470 475 480

Glu Pro Ile Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu

485 490 495

Phe Gly Asn Asp Pro Ser Ser Gln

500

<210> 316

<211> 498

<212> PRT

<213> Human immunodeficiency virus

<400> 316

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Lys Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Ile Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Arg Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Thr Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Lys Val Ser Gln
115 120 125

Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His Gln Ala
130 135 140

Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys

145 150 155 160

Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu Gly

165 170 175

Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His
180 185 190

Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala
195 200 205

Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala Pro Gly

210 215 220

Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr

225 230 235 240

Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro Val

245 250 255

Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val

260 265 270

Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys

275 280 285

Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala

290 295 300

Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu

305 310 315 320

Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly

325 330 335

Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly

340 345 350

Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Val

355 360 365

Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg Asn Gln

370 375 380

Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Arg Glu Gly His Ile Ala

385 390 395 400

Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys Gly Lys

405 410 415

Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe Leu

420 425 430

Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe Leu Gln

435 440 445

Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly

450 455 460

Glu Glu Thr Thr Thr Pro Ala Gln Lys Gln Glu Pro Thr Asp Lys Glu

465 470 475 480

Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser

485 490 495

Ser Gln

<210> 317

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 317

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Met Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Asn Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Arg Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Ser Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Lys Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Pro Gln Ser Arg Leu Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Arg Glu Asp
465 470 475 480

Lys Glu Met Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln
500

<210> 318
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<400> 318
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Ile Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Thr Ala Ala Asp Thr Gly Asn Ser Asn Gln Val

115 120 125

Ser Gln Asn Phe Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Ala Thr Ser Ser Ala Thr Ile Met Ile Gln Arg Gly Asn Phe Lys
370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Ser
450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480

Gln Gly Arg Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 319
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<400> 319

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Ser Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Ser Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln
500

<210> 320
<211> 498
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (30)..(30)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (43)..(43)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (149)..(149)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (392)..(392)

<223> Xaa can be any naturally occurring amino acid

<400> 320

Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp Glu Arg
1 5 10 15

Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Xaa His Val
20 25 30

Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Xaa Val Asn Pro Gly Leu
35 40 45

Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu Gln Pro
50 55 60

Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn Thr Val
65 70 75 80

Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Ile Lys Asp Thr Lys
85 90 95

Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys Lys Lys
100 105 110

Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val Ser Gln
115 120 125

Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln Ala
130 135 140

Leu Ser Pro Arg Xaa Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys
145 150 155 160

Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu Gly

165 170 175

Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His
180 185 190
Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala
195 200 205
Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Ile Ala Pro Gly
210 215 220
Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr
225 230 235 240

Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro Val
245 250 255
Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys Ile Val
260 265 270
Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys
275 280 285
Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala
290 295 300

Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu
305 310 315 320
Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly
325 330 335
Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly
340 345 350
Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Ile
355 360 365

Thr Ser Pro Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg Asn Gln
370 375 380
Arg Lys Ile Val Lys Cys Phe Xaa Cys Gly Lys Glu Gly His Ile Ala
385 390 395 400
Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Lys
405 410 415

Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala Asn Phe Leu
420 425 430

Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu Gln
435 440 445
Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly
450 455 460
Glu Glu Thr Ile Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp Lys Glu
465 470 475 480
Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Ser
485 490 495

Ser Gln

<210> 321
<211> 499
<212> PRT
<213> Human immunodeficiency virus
<400> 321
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Arg Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Asn Ser Ser Gln Val Ser

115 120 125

Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln

130 135 140

Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu

145 150 155 160

Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu

165 170 175

Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly

180 185 190

His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala

195 200 205

Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala Pro

210 215 220

Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser

225 230 235 240

Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro

245 250 255

Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile

260 265 270

Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly Pro

275 280 285

Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg

290 295 300

Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu

305 310 315 320

Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu

325 330 335

Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val

340 345 350

Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln

355 360 365

Val Thr Asn Ser Ala Thr Val Met Met Gln Arg Gly Asn Phe Arg Asn

370 375 380

Gln Lys Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile

385 390 395 400

Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415

Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe

450 455 460

Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Thr Ile Asp Lys

465 470 475 480

Glu Met Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro

485 490 495

Ser Ser Gln

<210> 322

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (64)..(64)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (106)..(106)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (275)..(275)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (287)..(287)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (366)..(366)

<223> Xaa can be any naturally occurring amino acid

<400> 322

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Xaa
50 55 60

Gln Pro Ala Leu Lys Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Asn Ile Glu Val Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Xaa Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Ser Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro Pro Ile

245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Xaa Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Xaa Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Xaa Met Ser
355 360 365
Gln Val Thr Asn Pro Ser Thr Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380
Asn Gln Lys Arg Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Asn Pro Ser Pro Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Leu Gln

500

<210> 323

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (219)..(219)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (331)..(331)

<223> Xaa can be any naturally occurring amino acid

<400> 323

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Asp Gly Cys Lys Gln Ile Ile Ala Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Val Val Thr Leu Tyr Cys Val His Lys Lys Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Ser Asn Ser Pro Val
115 120 125
Ser Gln Asn Phe Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Val His Pro Val Xaa Ala Gly Pro Val Ala
210 215 220

Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Xaa Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Thr Pro Pro Ala Ile Met Met Gln Lys Gly Asn Tyr Arg
370 375 380
Asn Gln Arg Lys Ser Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Pro Pro Gln Lys Gln Glu Arg Thr Asp Lys
465 470 475 480

Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro
485 490 495
Ser Ser Gln

<210> 324
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<400> 324
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Asn Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Glu Asn Arg Asn Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Asp Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Thr Ala Thr Met Met Met Gln Arg Gly Asn Phe Arg
370 375 380

Ser Pro Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Gln Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Ser Ser Gln Lys Gly Arg Pro Gly Asn Phe
435 440 445

Pro Gln Ser Arg Leu Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460

Phe Arg Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480

Lys Glu Leu Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 325

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 325

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Lys Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile
245 250 255

Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Val Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Glu Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Ser Asn Ser Ala Thr Val Met Met Gln Arg Gly Asn Phe Arg
370 375 380

Gly Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Arg Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Arg Glu Arg Pro Gly Asn Phe
435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Gln Glu Ser Phe Arg
450 455 460

Phe Gly Glu Glu Thr Thr Ala Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 326

<211> 495

<212> PRT

<213> Human immunodeficiency virus

<400> 326

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Ser Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Glu Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Val Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His

130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Ile Thr Asn Thr Ser Ala Thr Ile Met Met Gln Gly Gly Asn Phe
370 375 380
Arg Asn Gln Arg Lys Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ser Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Glu Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Glu Pro Lys Glu

465 470 475 480

Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro

485 490 495

<210> 327

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 327

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Ala Gly Asn Asn Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

His Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Gln Gly Met Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 328

<211> 505

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (184)..(184)

<223> Xaa can be any naturally occurring amino acid

<400> 328

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Gln Glu Glu Gln Asn Lys Cys Lys
100 105 110
Lys Lys Val Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Xaa Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Val His Pro Val Gln Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Thr Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Gln Ser Arg Leu Glu Pro Thr Ala Pro Pro
450 455 460
Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys
465 470 475 480

Gln Glu Pro Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser
485 490 495
Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 329
<211> 507
<212> PRT
<213> Human immunodeficiency virus
<400> 329
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Lys Pro Gly Gly Lys Lys Thr Tyr Lys Leu Lys
20 25 30

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His Ile Val Trp Ala Ser Arg Glu Leu Glu Gln Phe Ala Val Asn Pro
        35                  40                  45
Gly Leu Leu Glu Thr Ser Lys Gly Cys Arg Gln Ile Leu Gly Gln Leu
    50                  55                  60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65                  70                  75                  80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
                85                  90                  95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
            100                 105                 110
Gln Lys Ala Gln Gln Glu Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp
        115                 120                 125
Ala Gly Lys Asn Thr Gln Ala Ser Gln Asn Tyr Pro Ile Val Gln Asn
    130                 135                 140
Ile Gln Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn
145                 150                 155                 160

Ala Trp Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile
                165                 170                 175
Pro Met Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn
            180                 185                 190
Thr Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu
        195                 200                 205
Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro
    210                 215                 220

Val His Ala Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly
225                 230                 235                 240
Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp
                245                 250                 255
Met Thr Asn Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp
            260                 265                 270
Ile Ile Met Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser
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275 280 285

Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val
290 295 300
Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val
305 310 315 320
Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp
325 330 335
Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu
340 345 350

Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg
355 360 365
Val Leu Ala Glu Ala Met Ser Gln Val Thr Ser Ser Ala Asn Ile Met
370 375 380
Met Gln Arg Gly Asn Phe Arg Asn Gln Arg Arg Ile Val Lys Cys Phe
385 390 395 400
Asn Cys Gly Lys Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg
405 410 415

Lys Lys Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp
420 425 430
Cys Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His
435 440 445
Lys Gly Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala
450 455 460
Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Ala Pro Pro
465 470 475 480

Gln Lys Gln Glu Pro Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu
485 490 495
Arg Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 330
<211> 498

<212> PRT

<213> Human immunodeficiency virus

<400> 330

Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Lys Trp Glu Lys
1 5 10 15
Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Gln Leu Lys His Ile

20 25 30
Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro Gly Leu
35 40 45
Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu Gln Pro
50 55 60
Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn Thr Val
65 70 75 80
Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Arg Asp Thr Lys

85 90 95
Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys Lys Lys
100 105 110
Thr Gln Gln Ala Ala Ala Asp Thr Glu Asn Ser Ser Gln Val Ser Gln
115 120 125
Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln Ala
130 135 140
Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys

145 150 155 160
Ser Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu Ser Glu Gly
165 170 175
Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His
180 185 190
Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala
195 200 205
Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala Pro Gly

210 215 220

Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr
225 230 235 240
Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro Val
245 250 255
Gly Asp Ile Tyr Lys Lys Trp Ile Ile Ile Gly Leu His Lys Ile Val
260 265 270
Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys

275 280 285
Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala
290 295 300
Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu
305 310 315 320
Val Gln Asn Ala Asn Pro Asp Cys Arg Thr Ile Leu Lys Ala Leu Gly
325 330 335
Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly

340 345 350
Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Val
355 360 365
Thr Gly Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg Asn Gln
370 375 380
Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Val Gly His Ile Ala
385 390 395 400
Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Lys

405 410 415
Glu Gly His Gln Met Lys Glu Cys Asp Glu Arg Gln Ala Asn Phe Leu
420 425 430
Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu Gln
435 440 445
Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly
450 455 460
Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp Lys Glu

465 470 475 480

Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser

485 490 495

Ser Gln

<210> 331

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<400> 331

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Ser Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Lys Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ala Leu Arg Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Asn Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Gly Pro Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Ala Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Asp Leu Tyr Pro Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn

485 490 495

Asp Pro Ser Ser Gln

500

<210> 332

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<400> 332

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Lys Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Ala Val Ala Val Leu Tyr Cys Val His Gln Gly Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Arg Ile Glu Glu Glu Gln Glu Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Pro Gly Lys Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His
130 135 140
Gln Ser Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Lys

370 375 380

Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Thr Ala Pro Pro Glu Glu

450 455 460

Ser Phe Arg Phe Arg Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu

465 470 475 480

Pro Ile Asp Arg Glu Met Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe

485 490 495

Gly Asn Asp Pro Ser Ser Gln

500

<210> 333

<211> 498

<212> PRT

<213> Human immunodeficiency virus

<400> 333

Arg Ala Ser Ile Leu Ser Gly Gly Lys Leu Asp Arg Trp Glu Lys Ile

1 5 10 15

Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys His Ile Val

20 25 30

Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro Gly Leu Leu

35 40 45

Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu Gln Pro Ser

50 55 60

Leu Pro Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn Thr Val Ala

65 70 75 80

Thr Leu Tyr Cys Val His Gln Asn Ile Asp Val Lys Asp Thr Lys Glu
85 90 95

Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys Lys Lys Ala
100 105 110
Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Gly Ser Gln Asn
115 120 125
Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His Gln Ala Ile
130 135 140
Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys Ala
145 150 155 160

Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser Glu Gly Ala
165 170 175
Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His Gln
180 185 190
Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu
195 200 205
Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala Pro Gly Gln
210 215 220

Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Asn Leu
225 230 235 240
Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro Val Gly
245 250 255
Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg
260 265 270
Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile Lys Gln Gly Pro Lys Glu
275 280 285

Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu
290 295 300
Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val
305 310 315 320
Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro

325 330 335

Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly

340 345 350

Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Val Thr

355 360 365

Asn Ser Ala Thr Val Met Met Gln Arg Gly Asn Phe Arg Asn Gln Arg

370 375 380

Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile Ala Arg

385 390 395 400

Asn Cys Lys Ala Pro Arg Arg Arg Gly Cys Trp Lys Cys Gly Lys Glu

405 410 415

Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe Leu Gly

420 425 430

Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu Gln Ser

435 440 445

Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu

450 455 460

Glu Thr Thr Thr Pro Ser Pro Lys Gln Glu Pro Ile Asp Lys Asp Leu

465 470 475 480

Tyr Pro Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Leu

485 490 495

Ser Gln

<210> 334

<211> 505

<212> PRT

<213> Human immunodeficiency virus

<400> 334

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Thr Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Thr Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asp Lys Ser Lys

100 105 110

Gln Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Asn Asn Gln

115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val

130 135 140

His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val

145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu

165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val

180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu

195 200 205

Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile

210 215 220

Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr

225 230 235 240

Thr Ser Thr Leu Gln Glu Gln Val Gly Trp Met Thr Ser Asn Pro Pro

245 250 255

Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln

275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys

325 330 335

Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Ser Arg Val Thr Asn Ser Asn Ala Ile Met Met Gln Arg Gly Asn Phe

370 375 380

Lys Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe

450 455 460

Arg Phe Gly Glu Glu Thr Thr Ala Pro Pro Gln Lys Gln Glu Pro Ile

465 470 475 480

Asp Lys Glu Gln Gly Gln Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser

485 490 495

Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505

<210> 335

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (50)..(50)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (55)..(55)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (191)..(191)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (271)..(271)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (295)..(295)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (304)..(304)

<223> Xaa can be any naturally occurring amino acid

<400> 335

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Ile Asn Pro

35 40 45

Gly Xaa Leu Glu Thr Ser Xaa Gly Cys Arg Gln Ile Leu Gly Gln Ile

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Glu Gln Gln Ala Ala Ala Asn Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Leu Met Leu Asn Thr Xaa Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Asp Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Xaa Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Xaa Tyr Val Asp Arg Phe Tyr Arg Thr Xaa

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Lys

370 375 380

Asn Gln Arg Lys Met Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Ala Thr Pro Pro Gln Lys Gln Glu Pro Lys Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 336

<211> 494

<212> PRT

<213> Human immunodeficiency virus

<400> 336

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ala Glu Gly Cys Lys Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp

85 90 95
Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Asn Ser Pro Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Ser Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Ile Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Gly Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Pro Ser Gln Lys Gln Glu Arg Ile Pro Leu

465 470 475 480

Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln

485 490

<210> 337

<211> 505

<212> PRT

<213> Human immunodeficiency virus

<400> 337

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Ser Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Arg Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Thr Ala Ala Asp Thr Gly Asn Ser Ser Gln Asn
115 120 125
Ser Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly
130 135 140
Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val
145 150 155 160

Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe
165 170 175
Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu
180 185 190
Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr
195 200 205
Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala
210 215 220

Gly Pro Ala Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile
225 230 235 240
Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn

245 250 255

Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu

260 265 270

Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Ile Ser Ile Leu Asp

275 280 285

Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe

290 295 300

Tyr Lys Thr Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp

305 310 315 320

Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr

325 330 335

Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Ser

340 345 350

Ala Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala

355 360 365

Glu Ala Met Ser Gln Ala Thr Asn Ser Ala Ala Ala Ile Met Met Gln

370 375 380

Arg Gly Asn Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys

385 390 395 400

Gly Lys Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys

405 410 415

Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr

420 425 430

Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly

435 440 445

Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro

450 455 460

Glu Tyr Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys

465 470 475 480

Gln Glu Pro Ile Asp Lys Glu Thr Tyr Pro Leu Ala Ser Leu Lys Ser

485 490 495

Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 338

<211> 506

<212> PRT

<213> Human immunodeficiency virus

<400> 338

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Thr Leu Gln Thr Gly Ser Glu Glu Ile Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Gly Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Thr Asn Thr Ala Thr Ile Met Met Met Gln Arg Gly Asn Phe

370 375 380

Arg Asn Gln Arg Lys Ala Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Ser Arg Gln Gly Gln Asn Arg Leu Glu Pro Thr Ala Pro
450 455 460
Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln
465 470 475 480

Lys Gln Glu Pro Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys
485 490 495
Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 339
<211> 501
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (313)..(313)
<223> Xaa can be any naturally occurring amino acid
<400> 339
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Ala Gly Asn Asn Ser Ser Gln
115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val
130 135 140

His Gln Ser Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile
145 150 155 160
Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu
165 170 175
Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190
Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu
195 200 205

Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val
210 215 220
Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
225 230 235 240
Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro
245 250 255
Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn
260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln
275 280 285
Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr
290 295 300
Leu Arg Ala Glu Gln Ala Thr Gln Xaa Val Lys Asn Trp Met Thr Glu
305 310 315 320
Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys
325 330 335

Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln
340 345 350
Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met
355 360 365
Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe

370 375 380

Arg Ser Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser Asn Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe

450 455 460

Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile

465 470 475 480

Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn

485 490 495

Asp Pro Ser Ser Gln

500

<210> 340

<211> 498

<212> PRT

<213> Human immunodeficiency virus

<400> 340

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Arg Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Asn Ile Glu Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Glu Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Ser Gln
115 120 125
Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val
130 135 140

His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val
145 150 155 160
Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu
165 170 175
Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190
Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu
195 200 205

Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile
210 215 220
Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
225 230 235 240
Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro
245 250 255
Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn
260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln
275 280 285
Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr
290 295 300
Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu
305 310 315 320

Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys
325 330 335

Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln
340 345 350
Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met
355 360 365
Ser Gln Met Thr Asn Ser Ala Ala Ile Met Val Gln Arg Gly Asn Phe
370 375 380
Arg Asp Gln Arg Lys Ile Ile Lys Cys Phe Asn Cys Gly Lys Gln Gly
385 390 395 400

His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys
405 410 415
Cys Gly Gln Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala
420 425 430
Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn
435 440 445
Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe
450 455 460

Arg Phe Gly Glu Glu Thr Thr Pro Pro Ser Gln Lys Gln Glu Pro Ile
465 470 475 480
Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn
485 490 495
Asp Pro

<210> 341
<211> 494
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (17)..(17)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature

<222> (28)..(28)

<

223> Xaa can be any naturally occurring amino acid

<400> 341

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Gln Trp
1 5 10 15

Xaa Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Xaa Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Glu Ala Ala Asp Thr Gly Lys Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Ile Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Ser Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Gly Thr Ala Asn Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445
Pro Gln Ser Arg Thr Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Glu Glu Pro Pro Leu

465 470 475 480

Val Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln

485 490

<210> 342

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (15)..(15)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (267)..(267)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (331)..(331)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (343)..(343)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (374)..(374)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (453)..(453)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (473)..(473)

<223> Xaa can be any naturally occurring amino acid

<400> 342

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Xaa Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Gly Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Leu Thr Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Leu Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Xaa Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Xaa Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Xaa Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Thr Ala Ala Xaa Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Gln Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Leu Trp Pro Ser Gln Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Asn Arg Xaa Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Xaa Gln Lys Gln Glu Gln Ile Asp

465 470 475 480

Lys Glu Leu Asn His Ser Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Leu Leu Gln

500

<210> 343

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (384)..(384)

<223> Xaa can be any naturally occurring amino acid

<400> 343

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Gln Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30

His Leu Ile Trp Ala Gly Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Ile Lys Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys
100 105 110

Lys Lys Ala Glu Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Thr Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Thr Thr Val Met Met Gln Arg Gly Asn Phe Xaa
370 375 380
Asn Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Thr Ile Asp
465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Tyr Gln
500

<210> 344
<211> 501
<212> PRT
<213> Human immunodeficiency virus
<400> 344

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45

Ser Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Thr Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Met Thr Ser Pro Ala Asn Ile Met Met Gln Arg Gly Asn Phe Lys
370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Gln Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Leu Met
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Arg Asp
465 470 475 480

Lys Glu Leu Tyr Pro Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn
485 490 495
Asp Pro Ser Ser Gln
500

<210> 345
<211> 501
<212> PRT
<213> Human immunodeficiency virus
<400> 345
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Ile Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Val Ala Gly Thr Gly Asn Asn Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Ser Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Pro Ile
245 250 255
Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Ala Thr Asn Ser Ala Ala Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Arg Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Thr Glu Arg Gln Ala
420 425 430
Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn
435 440 445
Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe
450 455 460
Gly Phe Gly Glu Glu Lys Thr Thr Pro Ser Gln Lys Pro Glu Thr Thr
465 470 475 480

Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn
485 490 495
Asp Pro Ser Ser Gln
500

<210> 346
<211> 493
<212> PRT
<213> Human immunodeficiency virus
<400> 346
Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Thr Trp Glu Lys Ile Arg
1 5 10 15
Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys His Ile Val Trp
20 25 30

Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro Gly Leu Leu Glu

35 40 45

Thr Ala Glu Gly Cys Arg Gln Leu Leu Gly Gln Leu Gln Pro Ser Leu

50 55 60

Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn Thr Ile Ala Thr

65 70 75 80

Leu Tyr Cys Val His Gln Arg Ile Glu Val Arg Asp Thr Lys Glu Ala

85 90 95

Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys Lys Lys Ala Gln

100 105 110

Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val Ser Gln

115 120 125

Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln Ala

130 135 140

Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys

145 150 155 160

Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu Ser Glu Gly

165 170 175

Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His

180 185 190

Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala

195 200 205

Glu Trp Asp Arg Ile His Pro Ala Gln Ala Gly Pro Ile Ala Pro Gly

210 215 220

Gln Ile Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr

225 230 235 240

Leu Gln Glu Gln Ile Thr Trp Met Thr Asn Asn Pro Pro Ile Pro Val

245 250 255

Gly Glu Ile Tyr Lys Lys Trp Ile Ile Met Gly Leu Asn Lys Ile Val

260 265 270

Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys

275 280 285

Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala
290 295 300
Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu
305 310 315 320
Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly
325 330 335
Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly
340 345 350

Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Val
355 360 365
Thr Asn Ser Gly Ala Ile Met Met Gln Lys Gly Asn Phe Arg Asn Gln
370 375 380
Val Val Arg Cys Phe Asn Cys Gly Lys Val Gly His Ile Ala Lys Asn
385 390 395 400
Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Lys Glu Gly
405 410 415

His Gln Met Lys Asp Cys Asp Gln Arg Gln Ala Asn Phe Leu Gly Lys
420 425 430
Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu Gln Ser Arg
435 440 445
Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg Phe Gly Glu Glu
450 455 460
Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Gln Glu Tyr Pro Leu Ala
465 470 475 480

Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
485 490

<210> 347
<211> 502
<212> PRT
<213> Human immunodeficiency virus
<400> 347
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Asn Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Met Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser Gly

115 120 125

Asn Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met

130 135 140

Val His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Val Lys Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala

165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn

195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro

210 215 220

Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro

245 250 255

Ala Ile Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Met Gly Leu
260 265 270
Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg
275 280 285
Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300
Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr
305 310 315 320
Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335
Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350
Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365
Met Ser Gln Val Thr Asn Ser Ala Thr Val Met Met Gln Arg Gly Asn
370 375 380
Pro Arg Asn Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400
Gly His Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp
405 410 415
Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430
Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly
435 440 445
Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser
450 455 460
Phe Arg Phe Gly Glu Glu Thr Thr Ala Pro Pro Gln Lys Gln Glu Pro
465 470 475 480
Arg Asp Lys Glu Leu Tyr Pro Val Thr Ser Leu Arg Ser Leu Phe Gly

485 490 495
Asn Asp Pro Ser Ser Gln

500

<210> 348

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<400> 348

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Ser Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Gly Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Val Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Ile Leu

290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys His Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365
Gln Val Thr Asn Ser Thr Ile Met Met Gln Lys Gly Asn Phe Arg Asn
370 375 380
Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile
385 390 395 400
Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly
405 410 415
Lys Glu Gly His Gln Met Lys Asp Cys Ser Glu Arg Gln Ala Asn Phe

420 425 430
Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu
435 440 445
Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe

450 455 460

Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp Lys

465 470 475 480

Glu Gln Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro

485 490 495

Ser Ser Gln

<210> 349

<211> 504

<212> PRT

<213> Human immunodeficiency virus

<400> 349

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Arg Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Gln Ala Gln Gln Ala Ala Ala Gly Thr Gly Asn Asn Thr Gly Asn

115 120 125

Asn Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly

130 135 140

Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val

145 150 155 160

Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe

165 170 175

Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu

180 185 190

Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr

195 200 205

Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Pro Gln Ala

210 215 220

Gly Pro Ile Ala Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile

225 230 235 240

Ala Gly Thr Thr Ser Asn Leu Gln Glu Gln Ile Thr Trp Met Thr Asn

245 250 255

Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met

260 265 270

Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp

275 280 285

Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe

290 295 300

Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp

305 310 315 320

Met Thr Lys Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr

325 330 335

Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr

340 345 350

Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala

355 360 365

Glu Ala Met Ser Gln Val Thr Asn Ser Ala Thr Val Met Met Gln Arg

370 375 380

Gly Asn Phe Lys Gly Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly

385 390 395 400

Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly

405 410 415

Cys Trp Lys Cys Gly Gln Glu Gly His Gln Met Lys Asp Cys Thr Gly

420 425 430

Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg

435 440 445

Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala

450 455 460

Glu Ser Phe Arg Phe Gly Glu Glu Thr Pro Thr Pro Ser Gln Lys Gln

465 470 475 480

Glu Thr Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu

485 490 495

Phe Gly Asn Asp Pro Ser Ser Gln

500

<210> 350

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 350

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Lys Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Val

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Thr Ser Ser Asn Thr Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 351

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<400> 351

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ala Ile Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110
Lys Lys Val Gln Gln Glu Ala Ala Asp Thr Gly Ser Lys Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His
130 135 140
Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ala

165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Met Asn Ser Ala Thr Ile Met Met Gln Lys Ser Asn Phe Arg Asn

370 375 380

Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile

385 390 395 400

Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415

Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe

450 455 460

Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp Lys

465 470 475 480

Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro

485 490 495

Ser Ser Gln

<210> 352

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 352

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Met Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro

35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Thr Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Arg Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Ser Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Leu Thr Asn Ser Ala Asn Ile Met Met Gln Arg Gly Asn Met Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Val Phe Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 353

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<400> 353

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Gln Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Asn Lys Arg Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Thr Gly Asn Asn Ser Gln Ser

115 120 125

Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln

130 135 140

Met Val His Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys

145 150 155 160

Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr

165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn

180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile

195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Ala Gln Ala Gly

210 215 220

Pro Ile Ala Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala

225 230 235 240

Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Thr Trp Met Thr Asn Asn

245 250 255

Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly

260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile

275 280 285

Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr

290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met

305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile

325 330 335

Leu Lys Ala Leu Gly Pro Ala Ala Ser Leu Glu Glu Met Met Thr Ala

340 345 350

Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu

355 360 365

Ala Met Ser Gln Val Thr Asn Ser Asn Thr Ile Met Met Gln Arg Gly

370 375 380

Asn Phe Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys

385 390 395 400

Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys

405 410 415

Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg

420 425 430

Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro

435 440 445

Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu

450 455 460

Ser Phe Arg Phe Gly Glu Glu Ala Pro Ala Pro Ser Gln Lys Gln Glu

465 470 475 480

Thr Ile Asp Lys Glu Leu Tyr Pro Ser Ala Ser Leu Arg Ser Leu Phe

485 490 495

Gly Asn Asp Pro Ser Ser Gln

500

<210> 354

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 354

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Ala Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Ala Gly Asn Asn Arg Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Val Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Ser Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Lys Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Asp Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415
Gly Gln Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480
Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495
Pro Ser Ser Gln
500

<210> 355
<211> 499
<212> PRT
<213> Human immunodeficiency virus
<400> 355
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45
Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60
Gln Pro Ala Leu Lys Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser His Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His

130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Ala His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Leu Pro Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Gly Gln Arg Lys Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His Leu

385 390 395 400

Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys Gly

405 410 415

Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg Phe

450 455 460

Gly Glu Gly Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp Lys

465 470 475 480

Glu Thr Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro

485 490 495

Ser Ser Gln

<210> 356

<211> 463

<212> PRT

<213> Human immunodeficiency virus

<400> 356

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Ala Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Ala Gly Cys Arg Gln Ile Leu Asn Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Val Ala Asp Ala Gly Asn Asn Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Ser Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Ile Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe

450 455 460

<210> 357

<211> 462

<212> PRT

<213> Human immunodeficiency virus

<400> 357

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys

20 25 30

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His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
        35                  40                  45
Ser Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
    50                  55                  60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu His Asn
65                  70                  75                  80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
                85                  90                  95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
            100                 105                 110
Lys Lys Ala Gln Gln Ala Ala Ala Asn Thr Gly Asn Ser Asn Gln Ile
        115                 120                 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
    130                 135                 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145                 150                 155                 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
                165                 170                 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
            180                 185                 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
        195                 200                 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
    210                 215                 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225                 230                 235                 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
                245                 250                 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
            260                 265                 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
```

```
        275                 280                 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
    290                 295                 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305                 310                 315                 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
                325                 330                 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
            340                 345                 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
        355                 360                 365
Gln Val Thr Asn Ser Thr Thr Ile Met Met Gln Arg Gly Asn Asp Arg
    370                 375                 380
Asn Gln Arg Lys Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His Leu
385                 390                 395                 400

Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys Gly
                405                 410                 415
Gln Glu Gly His Gln Met Lys Glu Cys Pro Gly Arg Gln Ala Asn Phe
            420                 425                 430
Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu
        435                 440                 445
Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe
    450                 455                 460

<210>  358
<211>  500
<212>  PRT
<213>  Human immunodeficiency virus
<400>  358
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Asp Leu Asp Arg Trp
1               5                   10                  15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Met Leu Lys
            20                  25                  30
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His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Val Leu Glu Gln Leu

50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80
Thr Ile Ala Thr Leu Tyr Gly Val His Gln Lys Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly His Ser Ser Gln Val

115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Val His Pro Val Gln Ala Gly Leu Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Ile Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Ala Ile Met Met Gln Arg Gly Asn Phe Lys

370 375 380

Asn Gln Arg Lys Met Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Val Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Ile Glu Ser Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Leu Arg

450 455 460

Ser Gly Ile Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Val Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 359

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 359

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Glu Gly Lys Lys Arg Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Ile Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Tyr
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Gly Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Arg Asn Ile Gln Gly Gln Met Val His
130 135 140

Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Asp Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Ser Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Ala Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Val Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Asn Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Val Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Ala Thr Thr Ser Pro Gln Lys Gln Glu Leu Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495
Pro Leu Ser Gln
500

<210> 360

<211> 499
<212> PRT
<213> Human immunodeficiency virus
<400> 360

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ala Glu Gly Cys Lys Gln Ile Ile Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Asn Ser Lys Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Thr Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Asn Asn Phe Arg

370 375 380

Asp Gln Arg Arg Thr Val Lys Cys Phe Asn Cys Gly Arg Val Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Pro Pro Gln Lys Gln Glu Gln Ile Asp Lys

465 470 475 480

Glu Met Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro

485 490 495

Leu Ser Gln

<210> 361

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

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<222> (338)..(338)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (365)..(365)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (377)..(377)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (419)..(419)

<223> Xaa can be any naturally occurring amino acid

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<222> (437)..(437)

<223> Xaa can be any naturally occurring amino acid

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<222> (453)..(453)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (468)..(468)

<223> Xaa can be any naturally occurring amino acid

<400> 361

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Xaa Leu Glu Arg Phe Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Ile Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Ile Arg Xaa

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Xaa Ala Gln Gln Ala Ala Ala Asp Ala Glu Xaa Ser Ser Arg Gln

115 120 125

Val Ser Gln Asn Tyr Pro Ile Xaa Gln Asn Leu Gln Gly Gln Met Val

130 135 140

His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val

145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu

165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Ile Val

180 185 190

Gly Gly His Gln Ala Xaa Met Gln Met Leu Lys Glu Thr Ile Asn Glu

195 200 205

Glu Ala Ala Glu Trp Asp Arg Met His Pro Val His Xaa Gly Pro Ile

210 215 220

Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Xaa

225 230 235 240

Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro

245 250 255

Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn
260 265 270

Lys Thr Val Arg Met Tyr Ser Pro Ile Ser Ile Leu Asp Ile Arg Gln
275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr
290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu
305 310 315 320

Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Arg Thr Ile Xaa Lys
325 330 335

Ala Xaa Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln
340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Xaa Glu Ala Met
355 360 365

Ser Gln Val Thr Asn Ser Thr Ala Xaa Met Met Gln Lys Gly Asn Phe
370 375 380

Arg Asn Gln Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Arg Glu Gly
385 390 395 400

His Ile Ala Lys Asn Cys Lys Ala Pro Arg Lys Lys Gly Cys Trp Lys
405 410 415

Cys Gly Xaa Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala
420 425 430

Asn Phe Leu Gly Xaa Ile Trp Ser Ser His Lys Gly Arg Pro Gly Asn
435 440 445

Phe Leu Gln Ser Xaa Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe
450 455 460

Arg Phe Gly Xaa Gly Thr Ile Thr Pro Ser Gln Lys Gln Glu Pro Ile
465 470 475 480

Glu Lys Asp Lys Asp Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe
485 490 495

Gly Asn Asp Pro Leu Ser Gln

500

<210> 362

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (9)..(9)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (11)..(11)

<223> Xaa can be any naturally occurring amino acid

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<222> (17)..(17)

<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (100)..(100)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (127)..(127)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

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<220><221> misc_feature

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<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

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<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (455)..(455)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (459)..(459)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (462)..(462)

<223> Xaa can be any naturally occurring amino acid

<400> 362

Met Gly Ala Arg Ala Ser Val Leu Xaa Gly Xaa Asp Leu Asp Arg Trp
1 5 10 15

Xaa Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Xaa Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Gln Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Xaa Leu Asp Lys Ile Glu Glu Glu Gln Ser Lys Ser Lys
100 105 110

Lys Lys Val Gln Gln Ala Ala Ala Asp Ala Gly Thr Ser Ser Xaa Ser
115 120 125

Gln Val Ser His Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met

130 135 140

Val His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Xaa Val

145 150 155 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala

165 170 175

Leu Ser Glu Gly Xaa Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn

195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro

210 215 220

Val Ala Pro Gly Gln Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro

245 250 255

Pro Ile Pro Val Gly Glu Xaa Tyr Lys Arg Trp Ile Ile Leu Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Val Asn Asn Pro Thr Asn Ile Met Met Gln Arg Gly Asn

370 375 380

Phe Lys Asn Gln Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400
Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Arg Lys Gly Cys Trp
405 410 415
Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln
420 425 430
Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Xaa Gly Arg Pro Gly
435 440 445

Xaa Phe Leu Gln Ser Arg Xaa Glu Pro Ser Xaa Pro Pro Xaa Glu Ser
450 455 460
Phe Arg Phe Gly Glu Glu Lys Pro Thr Pro Pro Gln Lys Gln Glu Pro
465 470 475 480
Ile Asp Lys Asp Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly
485 490 495
Asn Asp Pro Ser Ser Gln
500

<210> 363
<211> 499
<212> PRT
<213> Human immunodeficiency virus

<400> 363
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Met Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Ile Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Gly Gln Leu
50 55 60

Gln Ser Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Arg Lys Thr Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Pro Thr Ile Met Met Gln Arg Gly Asn Phe Arg Asn
370 375 380

Gln Arg Arg Ile Ile Lys Cys Phe Asn Cys Gly Lys Asp Gly His Ile
385 390 395 400

Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly
405 410 415

Gln Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe
420 425 430

Leu Gly Lys Leu Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu
435 440 445

Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe
450 455 460

Gly Glu Glu Ala Thr Ala Pro Pro Gln Lys Gln Glu Pro Ile Asp Gln
465 470 475 480

Glu Arg Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro
485 490 495

Leu Ser Gln

<210> 364

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<220><221>

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<222> (28)..(28)

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<220><221> misc_feature

<222> (35)..(35)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (71)..(71)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (88)..(88)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (160)..(160)

<223> Xaa can be any naturally occurring amino acid

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<222> (425)..(425)

<223> Xaa can be any naturally occurring amino acid

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<222> (470)..(470)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (472)..(472)

<223> Xaa can be any naturally occurring amino acid

<400> 364

Met Gly Ala Arg Ala Ser Val Leu Ser Ala Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Xaa Tyr Arg Leu Lys

20 25 30

His Ile Xaa Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Xaa Ser Glu Glu Leu Arg Ser Leu His Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Xaa His Gln Asn Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Lys Lys Ser Gln

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Lys Asn Asn Pro Val Ser

115 120 125

Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His Gln

130 135 140

Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Xaa

145 150 155 160

Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu

165 170 175

Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly

180 185 190

His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala

195 200 205

Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala Pro

210 215 220

Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser

225 230 235 240

Thr Leu Gln Glu Gln Ile Asn Trp Met Thr Asn Asn Pro Pro Ile Pro

245 250 255

Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile

260 265 270

Val Arg Met Tyr Ser Pro Ala Ser Ile Leu Asp Ile Lys Gln Gly Pro

275 280 285

Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg

290 295 300

Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu

305 310 315 320

Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu

325 330 335

Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val

340 345 350

Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln

355 360 365

Val Thr Asn Ser Asn Thr Ile Met Met Gln Arg Gly Asn Phe Arg Asn

370 375 380

Gln Arg Lys Met Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile

385 390 395 400

Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415

Lys Glu Gly His Gln Met Lys Asp Xaa Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Asn Arg Pro Glu Pro Ser Ala Pro Pro Ala Glu Ser Phe Arg Phe

450 455 460

Gly Glu Glu Thr Thr Xaa Pro Xaa Gln Lys Gln Glu Pro Ile Asp Lys

465 470 475 480

Glu Leu Tyr Pro Ser Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro

485 490 495

Ser Ser Gln

<210> 365

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (127)..(127)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (487)..(487)

<223> Xaa can be any naturally occurring amino acid

<400> 365

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp His Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Arg Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Ile Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly His Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Ala Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Glu Ser Lys

100 105 110

Lys Arg Thr Gln Pro Ala Ala Ala Gly Ala Gly Asn Asn Ser Xaa Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ser Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Leu Ala Thr Asn Asn Gln Ala Thr Ile Met Met Gln Lys Gly Asn Phe
370 375 380

Lys Asn Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly
385 390 395 400
His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys
405 410 415
Cys Gly Lys Glu Gly His Gln Ile Lys Asp Cys Thr Glu Arg Gln Ala
420 425 430
Asn Phe Leu Gly Lys Val Trp Pro Ser Arg Asn Gly Arg Pro Gly Asn
435 440 445

Phe Leu Gln Asn Arg Pro Glu Pro Ser Ala Pro Pro Ala Glu Gly Ile
450 455 460
Lys Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Gly Pro Val
465 470 475 480
Glu Glu Gly Leu Tyr Pro Xaa Ala Ser Leu Arg Ser Leu Phe Gly Asn
485 490 495
Asp Pro Ser Ser Gln
500

<210> 366

<211> 498

<212> PRT

<213> Human immunodeficiency virus

<400> 366

Met Gly Ala Arg Ala Ser Val Ile Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Arg Ile Arg Leu Arg Gln Gly Gly Ser Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Tyr Ala Ile Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ala Ile Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Arg Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Lys Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Thr Ala Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380

Asn Gln Arg Lys Ala Val Lys Arg Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Gln Lys Gln Gly Pro Lys Asp Lys Glu

465 470 475 480

Leu Tyr Pro Leu Asp Ser Leu Lys Ser Leu Phe Gly Ser Asp Pro Ser

485 490 495

Leu Gln

<210> 367

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (182)..(182)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (202)..(202)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (213)..(213)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (275)..(275)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (304)..(304)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (349)..(349)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (353)..(353)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (389)..(389)

<223> Xaa can be any naturally occurring amino acid

<400> 367

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Gln Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Glu Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

His Pro Ser Leu Pro Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Xaa Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Xaa Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Xaa Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile
245 250 255
Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
260 265 270
Ile Val Xaa Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Xaa
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Xaa Cys Gln Gly
340 345 350

Xaa Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Xaa Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Ile Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Val Glu Glu Thr Thr Thr Pro Ser Gln Lys Pro Glu Thr Ile Asp

465 470 475 480

Lys Glu Val Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 368

<211> 506

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (225)..(225)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (330)..(330)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (360)..(360)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (441)..(441)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (466)..(466)

<223> Xaa can be any naturally occurring amino acid

<400> 368

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp His Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Ile Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Ile Glu Gln Leu

50 55 60

Gln Ser Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Thr Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Lys Ala Ala Asp Ala Gly Asn Ser Ser Thr

115 120 125

Val Ser Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ala Gln Gly Gln

130 135 140

Met Val His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys

145 150 155 160

Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser

165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn

180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile

195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Val His Pro Ala Gln Ala Gly

210 215 220

Xaa Val Ala Pro Gly Gln Ile Arg Asp Pro Arg Gly Ser Asp Ile Ala

225 230 235 240

Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn

245 250 255

Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly

260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile

275 280 285

Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr

290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met

305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ala Xaa Pro Asp Cys Lys Thr Ile

325 330 335

Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala

340 345 350

Cys Gln Gly Val Gly Gly Pro Xaa His Lys Ala Arg Val Leu Ala Glu

355 360 365

Ala Met Ser Gln Val Thr Asn Ser Thr Ala Ala Ala Met Met Gln Arg

370 375 380

Gly Asn Phe Arg Asp Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly

385 390 395 400

Lys Val Gly His Ile Ala Lys Asn Cys Arg Gly Pro Arg Lys Lys Gly

405 410 415

Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Asn Glu

420 425 430

Arg Gln Gly Gln Ala Asn Phe Leu Xaa Lys Ile Trp Pro Ser His Lys

435 440 445

Gly Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro

450 455 460

Pro Xaa Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln

465 470 475 480

Lys Gln Glu Thr Ile Asp Lys Glu Met Tyr Pro Leu Ala Ser Leu Lys

485 490 495

Ser Leu Phe Gly Asn Asp Pro Leu Ser Gln

500 505

<210> 369

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (15)..(15)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (23)..(23)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (48)..(48)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (61)..(61)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (164)..(164)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (182)..(182)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (223)..(223)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (243)..(243)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (274)..(274)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (370)..(370)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (372)..(372)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (409)..(409)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (460)..(460)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (464)..(464)

<223> Xaa can be any naturally occurring amino acid

<400> 369

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Xaa Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Xaa Gly Gly Lys Lys Arg Tyr Lys Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Xaa
35 40 45

Gly Leu Leu Glu Ser Ser Gly Gly Cys Lys Gln Ile Xaa Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Ile Val Val Leu Tyr Tyr Val His Gln Arg Ile Glu Ile Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Leu Glu Glu Glu Gln Asn Lys Cys Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Val Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Xaa Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Xaa Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Xaa Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Xaa Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Xaa Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Xaa Thr Xaa Thr Pro Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Gly Gln Arg Lys Ile Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Leu Ala Arg Asn Cys Arg Ala Pro Xaa Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ala Trp Ser Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Xaa Glu Ser Phe Xaa
450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Arg Gln Glu Pro Ile Asp
465 470 475 480

Lys Glu Val Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 370

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (108)..(108)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (176)..(176)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (228)..(228)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (430)..(430)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (467)..(467)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (471)..(471)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (475)..(475)

<223> Xaa can be any naturally occurring amino acid

<400> 370

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Asp Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Gln Leu Lys

20 25 30

His Ile Ile Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Arg Gln Leu
50 55 60

His Pro Ser Leu Glu Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Leu Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Xaa Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Asp Thr Gly Asn Ser Asn Pro
115 120 125

Gly Ser Gly Gly Ser Gln Asn Phe Pro Ile Val Gln Asn Leu Gln Gly
130 135 140

Gln Met Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val

145 150 155 160

Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Xaa
165 170 175

Thr Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu
180 185 190

Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr
195 200 205

Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala

210 215 220

Gly Pro Val Xaa Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile
225 230 235 240
Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn
245 250 255
Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu
260 265 270
Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp

275 280 285
Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe
290 295 300
Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp
305 310 315 320
Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr
325 330 335
Ile Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr

340 345 350
Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala
355 360 365
Glu Ala Met Ser Gln Val Thr Gly Ala Asn Thr Ile Met Met Gln Arg
370 375 380
Gly Asn Phe Lys Asn Gln Arg Lys Ala Val Lys Cys Phe Asn Cys Gly
385 390 395 400
Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly

405 410 415
Cys Trp Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Xaa Thr Glu
420 425 430
Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg
435 440 445
Pro Gly Asn Phe Leu Gln Asn Arg Thr Glu Pro Thr Ala Pro Pro Glu
450 455 460
Glu Ser Xaa Arg Phe Gly Xaa Glu Lys Thr Xaa Pro Pro Gln Lys Gln

465 470 475 480

Glu Pro Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Pro Gln

500

<210> 371

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (249)..(249)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (435)..(435)

<223> Xaa can be any naturally occurring amino acid

<400> 371

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ser Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Lys Thr Gly Ser Glu Glu Phe Arg Ser Leu Tyr Asn

65 70 75 80

Ala Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Glu Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Asn Lys Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gly Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Thr Xaa Met Thr Ser Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Gly Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ala His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Thr Ala Ile Met Met Gln Arg Gly Asn Phe Lys

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Xaa Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Thr Asp
465 470 475 480
Lys Glu His Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495
Pro Leu Ser Gln
500

<210> 372
<211> 503
<212> PRT
<213> Human immunodeficiency virus
<400
> 372

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30
His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Asn

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His

130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Val Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Asp Ile Tyr Lys Lys Trp Ile Ile Met Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Pro Gly Ser Ala Asn Ile Met Met Gln Arg Gly Asn Tyr Arg
370 375 380

Asn Gln Lys Lys Ser Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Val Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Pro Thr Ala Pro
450 455 460
Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln
465 470 475 480
Lys Gln Gly Met Thr Asp Lys Glu Met Tyr Pro Leu Thr Ser Leu Lys
485 490 495
Ser Leu Phe Gly Asn Asp Pro
500

<210> 373
<211> 507
<212> PRT
<213> Human immunodeficiency virus

<220><221> misc_feature
<222> (17)..(17)
<223> Xaa can be any naturally occurring amino acid
<400> 373

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Ala Trp
1 5 10 15
Xaa Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Arg Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser
115 120 125
Ser Gln Thr Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln
130 135 140
Met Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160
Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser
165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190
Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205
Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly
210 215 220
Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240

Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn

245 250 255

Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly

260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile

275 280 285

Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr

290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met

305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile

325 330 335

Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala

340 345 350

Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu

355 360 365

Ala Met Ser His Ile Thr Asn Ser Ala Thr Val Met Met Gln Arg Gly

370 375 380

Thr Phe Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys

385 390 395 400

Glu Gly His Ile Ala Arg Asn Cys Lys Ala Pro Arg Lys Lys Gly Cys

405 410 415

Trp Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg

420 425 430

Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro

435 440 445

Gly Asn Phe Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Leu Glu Pro

450 455 460

Thr Ala Pro Pro Glu Glu Ser Phe Arg Arg Glu Thr Ile Ala Pro Ser

465 470 475 480

Gln Lys Gln Glu Pro Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu

485 490 495

Arg Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 374

<211> 510

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (389)..(389)

<223> Xaa can be any naturally occurring amino acid

<400> 374

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Gln Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Leu Asp Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Phe Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gly Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Gly Gly Asn
115 120 125

Ser Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly
130 135 140

Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val
145 150 155 160

Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe
165 170 175

Thr Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu
180 185 190
Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr
195 200 205
Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala
210 215 220

Gly Pro Asn Pro Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile
225 230 235 240
Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser
245 250 255
Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu
260 265 270
Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp
275 280 285

Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe
290 295 300
Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Ala Glu Val Lys Gly Trp
305 310 315 320
Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr
325 330 335
Ile Leu Arg Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr
340 345 350

Ala Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala
355 360 365
Glu Ala Met Gly Gln Val Thr Asn Thr Ala Ala Thr Met Met Met Gln
370 375 380
Lys Gly Asn Phe Xaa Asn Gln Gly Lys Ile Val Lys Cys Phe Asn Cys
385 390 395 400
Gly Lys Thr Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys
405 410 415

Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr

420 425 430

Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly

435 440 445

Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro

450 455 460

Ala Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg Phe Gly Glu Glu Ala

465 470 475 480

Thr Ala Pro Ser Gln Lys Pro Glu Thr Arg Asp Glu Leu Tyr Pro Leu

485 490 495

Ala Ser Leu Lys Ser Leu Phe Gly Ser Asp Pro Ser Ser Gln

500 505 510

<210> 375

<211> 497

<212> PRT

<213> Human immunodeficiency virus

<400> 375

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Asn Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ser Ile Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gln Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Gln Lys Thr Gln Gln Ala Ala Ala Asp Thr Arg Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala

210 215 220
Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Gly Ser Ala Asn Val Met Met Gln Arg Gly Asn Phe Lys

370 375 380

Ser Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Thr Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Asn Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Val Trp Pro Phe His Lys Glu Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Arg Glu Glu Thr Thr Ala Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro

<210> 376

<211> 513

<212> PRT

<213> Human immunodeficiency virus

<400> 376

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Gln Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Thr Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Arg Ile Glu Glu Glu Gln Thr Lys Ser Lys
100 105 110
Lys Gln Ala Gln Gln Lys Gln Ala Gln Gln Ala Ala Ala Asp Thr Gly
115 120 125
Ser Ser Ser Asn Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln
130 135 140
Gly Gln Leu Val His Gln Ala Met Ser Pro Arg Thr Leu Asn Ala Trp
145 150 155 160

Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met
165 170 175
Phe Ala Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met
180 185 190
Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu
195 200 205
Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Ile His
210 215 220

Ala Gly Pro Ala Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp
225 230 235 240
Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr
245 250 255
Ser Asn Pro Pro Ile Gln Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile
260 265 270
Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu
275 280 285

Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg
290 295 300
Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn
305 310 315 320
Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys

325 330 335

Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met

340 345 350

Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu

355 360 365

Ala Glu Ala Met Ser Gln Val Asn Ala Ala Thr Val Met Met Gln Arg

370 375 380

Gly Asn Phe Arg Ser Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly

385 390 395 400

Lys Asp Gly His Ile Ala Arg Asn Cys Lys Ala Pro Arg Arg Lys Gly

405 410 415

Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Asn Asn

420 425 430

Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly

435 440 445

Arg Pro Gly Asn Phe Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Ser

450 455 460

Arg Thr Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu

465 470 475 480

Glu Thr Ala Thr Ser Ser Gln Lys Gln Glu Pro Ile Asp Lys Gly Leu

485 490 495

Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Leu Ser

500 505 510

Gln

<210> 377

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 377

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Ile Lys Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys

100 105 110

Lys Lys Val Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Phe Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Ser Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Ser Lys Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Ser Asp

485 490 495

Pro Ser Leu Gln

500

<210> 378

<211> 505

<212> PRT

<213> Human immunodeficiency virus

<400> 378

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Asn Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Asn Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Asn Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Arg Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Ala Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Gly Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Thr Ala Pro Thr Ala Pro

450 455 460

Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Met Thr Pro Ser Gln Lys

465 470 475 480

Gln Glu Arg Ile Asp Lys Glu Pro Ser Pro Leu Ala Ser Leu Arg Ser

485 490 495

Leu Phe Gly Ser Asp Pro Ser Ser Gln

500 505

<210> 379

<211> 510

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (247)..(247)

<223> Xaa can be any naturally occurring amino acid

<400> 379

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Asn Lys Arg Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Thr Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Gln Lys Ala Gln Gln Ala Ala Ala Ala Ala Ala Ala Asp Thr Gly Asn

115 120 125

Ser Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly

130 135 140

Gln Met Val His Gln Pro Ile Ala Ala Arg Thr Leu Asn Ala Trp Val
145 150 155 160
Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe
165 170 175
Thr Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu
180 185 190
Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr

195 200 205

Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala
210 215 220
Gly Pro Val Ala Pro Gly Gln Leu Arg Glu Pro Arg Gly Ser Asp Ile
225 230 235 240
Ala Gly Thr Thr Ser Thr Xaa Gln Glu Gln Ile Gly Trp Met Thr Asn
245 250 255
Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Val Leu

260 265 270

Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp
275 280 285
Ile Lys Gln Gly Pro Lys Glu Ser Phe Arg Asp Tyr Val Asp Arg Phe
290 295 300
Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp
305 310 315 320
Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr

325 330 335

Ile Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr
340 345 350
Ala Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala
355 360 365
Glu Ala Met Ser Gln Ala Thr Asn Ser Ser Ala Ile Met Met Gln Lys

370 375 380

Gly Asn Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly

385 390 395 400

Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly

405 410 415

Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Ser

420 425 430

Gly Gln Ala Asn Phe Leu Gly Arg Leu Trp Pro Ser His Lys Gly Arg

435 440 445

Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Thr Ala

450 455 460

Pro Pro Glu Glu Ser Phe Arg Phe Val Glu Glu Thr Ala Thr Pro Ser

465 470 475 480

Gln Lys Gln Glu Lys Gln Glu Pro Ile Asp Arg Glu Met Tyr Pro Leu

485 490 495

Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505 510

<210> 380

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (59)..(59)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (102)..(102)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (129)..(130)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (133)..(133)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (144)..(144)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (437)..(437)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (445)..(445)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (466)..(466)

<223> Xaa can be any naturally occurring amino acid

<400> 380

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Ser Ser Glu Gly Cys Lys Xaa Ile Leu Ile Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Gly Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Xaa Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser
115 120 125

Xaa Xaa Val Ser Xaa Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Xaa
130 135 140

Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys

145 150 155 160

Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser

165 170 175

Ala Leu Ala Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn

180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile

195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly

210 215 220

Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala

225 230 235 240

Gly Thr Thr Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn

245 250 255

Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly

260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile

275 280 285

Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr

290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met

305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile

325 330 335

Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala

340 345 350

Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu

355 360 365

Ala Met Ser Gln Thr Asn Ser Ala Ser Ile Met Met Gln Arg Gly Asn

370 375 380

Phe Arg Ser His Lys Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu

385 390 395 400

Gly His Ile Ala Ser Lys Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Xaa Lys Ile Trp Pro Pro Tyr Lys Xaa Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser

450 455 460

Phe Xaa Phe Gly Glu Gly Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro

465 470 475 480

Ile Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln

500

<210> 381

<211> 505

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (424)..(424)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (435)..(435)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (447)..(447)

<223> Xaa can be any naturally occurring amino acid

<400> 381

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gly Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

```
            20                  25                  30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
        35                  40                  45

Ala Leu Leu Glu Ser Ser Gly Gly Cys Arg Gln Ile Leu Gln Gln Leu
    50                  55                  60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65                  70                  75                  80
Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
                85                  90                  95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
            100                 105                 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Ala Ala Asp Thr Gly Asn Ser
        115                 120                 125
Ser Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly
    130                 135                 140
Gln Met Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val
145                 150                 155                 160
Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe
                165                 170                 175

Thr Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu
            180                 185                 190
Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr
        195                 200                 205
Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala
    210                 215                 220
Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile
225                 230                 235                 240

Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His
                245                 250                 255
Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu
            260                 265                 270
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Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp
275 280 285

Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe
290 295 300

Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp
305 310 315 320

Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr
325 330 335

Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr
340 345 350

Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala
355 360 365

Glu Ala Met Gly Gln Val Asn Ser Gly Ala Ile Met Met Gln Lys Gly
370 375 380

Asn Phe Lys Ser Gln Arg Arg Asn Val Lys Cys Phe Asn Cys Gly Lys
385 390 395 400

Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys
405 410 415

Trp Lys Cys Gly Lys Glu Gly Xaa Gln Met Lys Asp Cys Thr Glu Arg
420 425 430

Gln Ala Xaa Phe Leu Gly Lys Leu Trp Pro Ser His Lys Gly Xaa Pro
435 440 445

Gly Asn Phe Pro Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Pro Pro
450 455 460

Ala Glu Ser Phe Arg Phe Gly Glu Glu Met Thr Thr Pro Ala Gln Lys
465 470 475 480

Gln Glu Pro Ile Asp Lys Glu Thr Tyr Pro Leu Ala Ser Leu Arg Ser
485 490 495

Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 382

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 382

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Ser Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Ser Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Ile Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Arg Ala Gln Leu Ala Ala Ala Asp Thr Gly Ser Ser Ser Lys Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His
130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ala
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Leu Ala Thr Asn Ser Asn Thr Ile Met Met Gln Arg Gly Asn Phe Lys
370 375 380

Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460

Phe Gly Glu Glu Thr Ala Ser Pro Pro Gln Lys Gln Asp Gln Thr Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Ser Asp

485 490 495

Pro Ser Ser Gln

500

<210> 383

<211> 497

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (31)..(31)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (88)..(88)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (138)..(138)

<223> Xaa can be any naturally occurring amino acid

<400> 383

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Met Gly Arg Lys Lys Tyr Arg Xaa Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Ala Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Xaa His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Xaa Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ala Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Ile Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380

Asn Gln Arg Arg Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg
450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Pro Pro Lys Gln Glu Gln Val Asp
465 470 475 480

Asn Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Leu Ser
485 490 495

Gln

<210> 384

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (46)..(46)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (57)..(57)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (225)..(225)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (228)..(228)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (388)..(388)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (446)..(446)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (486)..(486)

<223> Xaa can be any naturally occurring amino acid

<400> 384

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Xaa Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Thr Gly Xaa Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Ile Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Ser Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Xaa Gly Gln Xaa Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Met Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Ala Thr Asn Ser Val Ser Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380

Gly Gln Lys Xaa Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Xaa Asn Phe

435 440 445

Leu Gln Asn Arg Thr Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Gly

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Lys Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Xaa Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Gln Ser Ser Gln

500

<210> 385

<211> 505

<212> PRT

<213> Human immunodeficiency virus

<400

> 385

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ser Ile Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

His Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Ala Ile Ala Val Leu Phe Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser His Thr
115 120 125

Gly Asn Ser Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile
130 135 140
Gln Gly Gln Met Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala
145 150 155 160
Trp Val Lys Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro
165 170 175
Met Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr
180 185 190

Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys
195 200 205
Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Pro
210 215 220
Gln Ala Gly Pro Val Ala Pro Gly Gln Met Arg Asp Pro Arg Gly Ser
225 230 235 240
Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met
245 250 255

Thr Ser Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile
260 265 270
Ile Met Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile
275 280 285
Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp
290 295 300
Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys
305 310 315 320

Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys
325 330 335
Lys Thr Ile Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met

340 345 350

Met Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val

355 360 365

Leu Ala Glu Ala Met Ser Gln Val Thr Asn Ala Gly Asn Ile Met Met

370 375 380

Gln Lys Gly Asn Phe Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn

385 390 395 400

Cys Gly Lys Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys

405 410 415

Lys Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys

420 425 430

Ala Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys

435 440 445

Gly Arg Pro Gly Asn Phe Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro

450 455 460

Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln

465 470 475 480

Lys Gln Glu Val Asp Lys Glu Leu Tyr Pro Leu Ser Ser Leu Lys Ser

485 490 495

Leu Phe Gly Ser Asp Pro Ser Ser Gln

500 505

<210> 386

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 386

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp
85 90 95
Thr Lys Glu Ala Ile Asp Lys Ile Glu Glu Glu Lys Ala Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Thr Ala Ala Ala Ala Thr Gly Asn Ser Ser Gln

115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val
130 135 140
His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val
145 150 155 160
Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu
165 170 175
Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val

180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu
195 200 205
Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile
210 215 220
Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
225 230 235 240
Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro

245 250 255

Ile Gln Val Gly Glu Val Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn
260 265 270
Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln
275 280 285
Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys

325 330 335

Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Ser Gln Val Asn Ser Ala Thr Val Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Lys Arg Gln Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Lys Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 387

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (133)..(133)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (186)..(186)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (298)..(298)

<223> Xaa can be any naturally occurring amino acid

<400> 387

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Ala Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Thr Glu Glu Ile Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Glu Gln Gln Ala Ala Ala Gly Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Xaa Ile Val Gln Asn Ile Gln Gly Gln Met Val His
130 135 140

Gln Pro Leu Thr Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ser Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Xaa Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Pro Gln Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Asn Leu Gln Glu Gln Ile Thr Trp Met Thr Ser Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Xaa Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Gly Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Ala Thr Asn Ser Ala Asn Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Thr Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Gln Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Leu Glu Pro Thr Ala Pro Pro Glu Glu Ser Leu Arg

450 455 460

Phe Arg Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Thr Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 388

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (332)..(332)

<223> Xaa can be any naturally occurring amino acid

<400> 388

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Arg Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Ser Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Gln Gln Ala Ala Ala Ala Asp Thr Gly Asn

115 120 125

Ser Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly

130 135 140

Gln Met Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val

145 150 155 160

Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe

165 170 175

Thr Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu

180 185 190

Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr

195 200 205

Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala

210 215 220

Gly Pro Ile Pro Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile

225 230 235 240

Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Thr Trp Met Thr Asn

245 250 255

Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu

260 265 270

Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp

275 280 285

Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe

290 295 300

Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp

305 310 315 320

Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Xaa Asp Cys Lys Thr

325 330 335

Ile Leu Lys Ala Leu Gly Pro Ala Cys Thr Leu Glu Glu Met Met Thr

340 345 350

Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala

355 360 365

Glu Ala Met Ser Gln Ala Thr His Thr Ala Ile Leu Met Gln Arg Gly

370 375 380

Asn Phe Lys Asn Gln Arg Lys Ser Val Lys Cys Phe Asn Cys Gly Lys

385 390 395 400

Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys

405 410 415

Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg

420 425 430

Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro

435 440 445

Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu

450 455 460

Ser Phe Arg Phe Gly Glu Glu Met Pro Ala Pro Ser Gln Lys Gln Glu

465 470 475 480

Pro Ile Asp Lys Glu Leu Tyr Pro Ser Ala Ala Leu Arg Ser Leu Phe

485 490 495

Gly Asn Asp Pro Leu Ser Gln

500

<210> 389

<211> 504

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (393)..(393)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (399)..(399)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (410)..(410)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (420)..(420)

<223> Xaa can be any naturally occurring amino acid

<400> 389

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Asn Ser
115 120 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140

Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160

Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala
165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro
210 215 220
Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240
Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro
245 250 255
Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu
260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys
275 280 285
Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
290 295 300
Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr
305 310 315 320
Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350
Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365
Met Ser Gln Val Thr Asn Ser Ala Ser Ala Ala Ile Met Met Gln Arg
370 375 380
Gly Asn Phe Arg Asn Gln Arg Lys Xaa Val Lys Cys Phe Asn Xaa Gly
385 390 395 400

Lys Glu Gly His Ile Ala Lys Asn Cys Xaa Ala Pro Arg Lys Lys Gly
405 410 415
Cys Trp Lys Xaa Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu
420 425 430
Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg
435 440 445
Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu

450 455 460

Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln
465 470 475 480
Glu Pro Arg Asp Lys Glu Met Tyr Pro Leu Ala Ser Leu Arg Ser Leu
485 490 495
Phe Gly Asn Asp Pro Leu Ser Gln
500

<210> 390
<211> 499
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (13)..(13)
<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
<222> (119)..(119)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (179)..(179)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (407)..(407)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (411)..(411)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (467)..(467)
<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
<222> (481)..(481)
<223> Xaa can be any naturally occurring amino acid

<400> 390

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Xaa Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Lys Gln Leu
50 55 60

Gln Pro Ser Leu Glu Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Glu Ala Gln Gln Thr Xaa Ala Ala Gly Thr Gly Asn Ser Ser Gln
115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val
130 135 140

His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val
145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu
165 170 175

Ser Glu Xaa Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu
195 200 205

Glu Ala Ala Glu Trp Asp Arg Leu His Pro Ala Gln Ala Gly Pro Val
210 215 220

Ala Pro Gly Gln Val Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
225 230 235 240

Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro Pro
245 250 255
Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn
260 265 270
Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln
275 280 285
Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr
290 295 300

Leu Arg Ala Glu Gln Ser Ser Gln Glu Val Lys Asn Trp Met Thr Glu
305 310 315 320
Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys
325 330 335
Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln
340 345 350
Gly Val Gly Gly Pro Ala His Lys Ala Arg Val Leu Ala Glu Ala Met
355 360 365

Ser Gln Ala Thr Asn Ser Pro Ala Ile Met Met Gln Arg Gly Asn Phe
370 375 380
Arg Asn Gln Arg Lys Ile Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly
385 390 395 400
His Leu Ala Arg Asn Cys Xaa Ala Pro Arg Xaa Lys Gly Cys Trp Lys
405 410 415
Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Asn Asn Glu Arg Gln
420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Cys Lys Gly Arg Pro Gly
435 440 445
Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser
450 455 460
Leu Arg Xaa Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Ser
465 470 475 480
Xaa Asp Lys Glu Lys Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly

485 490 495

Asn Asp Pro

<210> 391

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (44)..(44)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (55)..(55)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (59)..(59)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (63)..(63)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (110)..(110)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (117)..(117)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (127)..(127)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (158)..(158)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (263)..(263)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
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<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (297)..(297)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (329)..(329)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (333)..(333)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (359)..(359)
<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
<222> (375)..(375)
<223> Xaa can be any naturally occurring amino acid
<400> 391

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Xaa Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Xaa Gly Cys Arg Xaa Ile Leu Gly Xaa Leu
50 55 60

His Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Xaa Ser Lys
100 105 110

Lys Lys Ala Gln Xaa Ala Ala Ala Asp Thr Gly Asn Ser Ser Xaa Ser
115 120 125
His Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140
Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Xaa Lys Val
145 150 155 160
Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala
165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
180 185 190
Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205
Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro
210 215 220
Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro
245 250 255
Pro Ile Pro Val Gly Glu Xaa Tyr Lys Arg Trp Ile Ile Leu Gly Leu
260 265 270
Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg
275 280 285
Gln Gly Pro Lys Glu Xaa Phe Arg Xaa Tyr Val Asp Arg Phe Tyr Lys
290 295 300

Thr Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr
305 310 315 320
Glu Thr Leu Leu Val Gln Asn Ser Xaa Pro Asp Cys Xaa Thr Ile Leu
325 330 335
Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Xaa His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Ala Thr Asn Xaa Ala Ala Ile Met Met Gln Arg Gly Asn

370 375 380

Phe Arg Asn Gln Arg Lys Pro Ile Lys Cys Phe Asn Cys Gly Lys Glu

385 390 395 400

Gly His Val Ala Arg Asn Cys Lys Ala Pro Arg Lys Lys Gly Cys Trp

405 410 415

Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Asn Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser

450 455 460

Phe Arg Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Glu Pro

465 470 475 480

Ile Asp Lys Asp Leu Tyr Pro Ser Ala Ser Leu Arg Ser Leu Phe Gly

485 490 495

Asn Asp His Ser Ser Gln

500

<210> 392

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 392

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Val Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His
130 135 140
Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asn Arg Leu His Pro Val His Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Ser Ala Ala Val Met Met Gln Lys Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Gln Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Ile Thr Ala Pro Ser Gln Lys Gln Glu Leu Arg Asp
465 470 475 480
Lys Glu Gln His Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495

Pro Leu Ser Gln
500

<210> 393
<211> 500
<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (72)..(72)

<223> Xaa can be any naturally occurring amino acid

<400> 393

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Xaa Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Val Ala Ala Asp Thr Gly Ser Asn Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys

260 265 270

Val Val Lys Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Pro Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Ser Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480
Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495
Pro Ser Ser Gln
500

<210> 394
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<400> 394
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Gln Leu Arg Pro Gly Gly Arg Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ala Leu Gln Thr Gly Thr Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110
Lys Lys Ala Gln Gln Val Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Cys Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Leu Ser Gln

500

<210> 395

<211> 505

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (48)..(48)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (267)..(267)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (392)..(392)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (436)..(436)

<223> Xaa can be any naturally occurring amino acid

<400> 395

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Xaa
35 40 45
Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Ile Gly Leu

50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Phe Lys Ser Val Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Lys Gly Gln Val

115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Xaa Met Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Arg Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ala His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Asn Val Met Met Gln Arg Gly Asn Phe Lys

370 375 380

Asn Gln Arg Lys Ile Val Lys Xaa Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Xaa Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro Glu Glu

450 455 460

Ser Phe Arg Phe Gly Glu Glu Thr Ala Thr Pro Pro Gln Lys Gln Glu

465 470 475 480

Gln Ile Asp Arg Asp Arg Asp Leu Tyr Pro Leu Ala Ser Leu Arg Ser

485 490 495

Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505

<210> 396

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 396

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Tyr Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu His Thr Gly Ser Glu Gly Phe Arg Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Asp Thr Gly Asn Ser Asn Pro Val Ser

115 120 125

Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln
130 135 140

Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu
145 150 155 160

Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu Ser Glu
165 170 175

Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly

180 185 190

His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala
195 200 205

Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala Pro

210 215 220

Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser

225 230 235 240

Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile Pro

245 250 255

Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Met Gly Leu Asn Lys Ile

260 265 270

Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly Pro

275 280 285

Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg

290 295 300

Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu

305 310 315 320

Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu

325 330 335

Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val

340 345 350

Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln

355 360 365

Ala Thr Asn Ser Ala Ala Ile Met Met Met Gln Lys Gly Asn Gly Arg

370 375 380

Asn Gln Arg Lys Gly Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Gly Glu Thr Ala Thr Pro Ser Gln Lys Gln Glu Pro Arg Asp
465 470 475 480
Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln
500

<210> 397

<211> 502
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (112)..(112)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (118)..(118)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (380)..(380)
<223> Xaa can be any naturally occurring amino acid
<400> 397
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Ala Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60
Gln Pro Ala Leu Gln Thr Gly Thr Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Gln Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Xaa
100 105 110

Lys Lys Ala Gln Gln Xaa Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Thr Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Asp Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Ile Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Met Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ala His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Pro Gly Thr Ile Met Val Gln Xaa Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Phe Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Leu Ile Asp

465 470 475 480

Lys Asp Lys Glu Gln Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln

500

<210> 398

<211> 506

<212> PRT

<213> Human immunodeficiency virus

<400> 398

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Ser Lys Lys Lys Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ala Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Arg Ala Gln Gln Ala Gln Gln Ala Ala Ala Ala Ala Ala Asp Thr Gly
115 120 125
Ser Ser Ser Ser Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln
130 135 140

Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp
145 150 155 160
Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met
165 170 175
Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met
180 185 190
Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu
195 200 205

Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His
210 215 220
Ala Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp
225 230 235 240
Ile Ala Gly Thr Thr Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr
245 250 255
Asn Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile
260 265 270

Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu
275 280 285
Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg

290 295 300

Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn
305 310 315 320

Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys
325 330 335

Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met
340 345 350

Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Lys Ile Leu
355 360 365

Ala Glu Ala Met Ser Gln Val Thr Asn Ala Ala Thr Ile Met Met Thr
370 375 380

Gln Lys Gly Asn Phe Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn
385 390 395 400

Cys Gly Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys
405 410 415

Arg Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys
420 425 430

Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys
435 440 445

Gly Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro
450 455 460

Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Ile Thr Pro Ser Gln
465 470 475 480

Lys Gln Glu Val Met Asp Lys Glu Val Tyr Pro Leu Thr Ser Leu Arg
485 490 495

Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 399

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (322)..(322)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (496)..(496)

<223> Xaa can be any naturally occurring amino acid

<400> 399

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Arg Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Pro Ala Ala Ala Asp Thr Gly Lys Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu His Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Xaa Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Asn Ile Met Met Gln Lys Ser Ser Phe Arg

370 375 380

Ser Pro Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Ala Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Asn Arg Ser Glu Pro Thr Ala Pro Leu Glu Pro Thr Ala Pro
450 455 460
Pro Ala Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln
465 470 475 480
Thr Gln Gln Pro Ile Glu Lys Glu Leu Tyr Pro Leu Thr Ser Leu Xaa
485 490 495

Ser Leu Phe Gly Asn Asp Pro
500

<210> 400
<211> 501
<212> PRT
<213> Human immunodeficiency virus
<400> 400
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Gln Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ala Leu Gln Thr Gly Thr Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Gly Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Leu His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Thr

355 360 365

Gln Val Thr Lys Pro Ala Ala Thr Met Met Val Gln Arg Gly Asn Phe

370 375 380

Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys
405 410 415
Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala
420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser Cys Lys Gly Arg Pro Gly Asn
435 440 445
Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe
450 455 460
Arg Phe Gly Glu Glu Thr Thr Asn Pro Ser Gln Lys Gln Glu Pro Ile
465 470 475 480
Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn
485 490 495

Asp Pro Ser Ser Gln
500

<210> 401
<211> 499
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (6)..(6)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (91)..(91)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (115)..(115)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (159)..(159)
<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
<222> (163)..(163)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (193)..(193)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (210)..(210)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (230)..(230)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (286)..(286)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (295)..(295)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (328)..(328)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (331)..(331)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (362)..(362)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (410)..(410)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (420)..(420)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (441)..(441)

<223> Xaa can be any naturally occurring amino acid

<400> 401

Met Gly Ala Arg Ala Xaa Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Arg Xaa Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Thr Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Glu Lys Xaa Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Arg Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His
130 135 140

Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Xaa Glu
145 150 155 160

Glu Lys Xaa Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Xaa His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Xaa Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Xaa Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Xaa Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Xaa Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Xaa Asp Cys Xaa Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Xaa Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Thr Ile Met Met Gln Lys Gly Asn Phe Arg Asn

370 375 380

Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile

385 390 395 400

Ala Arg Asn Cys Arg Ala Pro Arg Lys Xaa Gly Cys Trp Lys Cys Gly

405 410 415

Lys Glu Gly Xaa Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Arg Ile Trp Pro Ser Ser Xaa Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe

450 455 460

Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Gly Arg Ile Asp Thr

465 470 475 480

Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro

485 490 495

Ser Ser Gln

<210> 402

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 402

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Ile Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Val Gln Leu Ala Ala Thr Asp Lys Glu Lys Ser Gly Gln Val Ser

115 120 125

Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln

130 135 140

Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu

145 150 155 160

Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu

165 170 175

Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly
180 185 190
His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala
195 200 205
Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala Pro
210 215 220
Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser

225 230 235 240
Asn Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile Pro
245 250 255
Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile
260 265 270
Val Arg Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile Lys Gln Gly Pro
275 280 285
Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg

290 295 300
Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr Leu
305 310 315 320
Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu
325 330 335
Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val
340 345 350
Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln

355 360 365
Val Thr Ser Ser Ser Ala Thr Ile Met Met Gln Arg Gly Asn Pro Arg
370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Thr Thr Pro Ser Gln Lys Gln Glu Gln

465 470 475 480

Lys Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln

500

<210> 403

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<400> 403

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Ile Arg Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Thr Asp Thr Gly Asn Ser Asn Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Asn Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Thr His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Val Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ala Ala Ile Met Met Gln Lys Gly Asn

370 375 380

Phe Arg Thr Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu

385 390 395 400

Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser

450 455 460

Phe Arg Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Glu Pro

465 470 475 480

Ile Asp Lys Glu Met Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly

485 490 495

Asn Asp Pro

<210> 404

<211> 498

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (103)..(103)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (218)..(218)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (352)..(352)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

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222> (406)..(406)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (447)..(447)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (480)..(480)

<223> Xaa can be any naturally occurring amino acid

<400> 404

Met Gly Ala Arg Ala Ser Val Leu Ser Ala Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Ala Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Xaa Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Ala Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Xaa His Ala Gly Pro Val Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Asn Leu Gln Glu Gln Ile Thr Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ser Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln Xaa
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Lys Ser Pro Thr Ile Met Val Gln Gly Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Xaa Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Ser Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Ser Ser His Lys Gly Arg Pro Gly Xaa Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Ala Thr Pro Pro Gln Lys Gln Glu Asp Lys Xaa

465 470 475 480

Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Ser

485 490 495

Ser Gln

<210> 405

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (44)..(44)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (244)..(244)

<223> Xaa can be any naturally occurring amino acid

<400> 405

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Gln Gly Gly Lys Lys Lys Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Xaa Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Pro Gln Gly Gln Met Ile His

130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Ile Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205
Ala Ala Glu Trp Asp Arg Met His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Xaa Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270
Ile Val Arg Met Tyr Ser Pro Ile Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Pro Ala Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Arg Glu Gly His

385 390 395 400

Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Ser Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Ser Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Ser Asp

485 490 495

Pro Ser Ser Gln

500

<210> 406

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (114)..(114)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (125)..(125)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (486)..(486)

<223> Xaa can be any naturally occurring amino acid

<400> 406

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

His Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Arg Ser Lys
100 105 110

Lys Xaa Ala Gln Gln Ala Ala Ala Asp Thr Gly Ser Xaa Asn Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Leu Val His
130 135 140

Gln Pro Met Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ser Phe Ser Pro Glu Val Ile Pro Met Phe Ile Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Gln Val Gly Asp Ile Tyr Lys Arg Trp Ile Val Ile Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Thr Asn Ser Ala Asn Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Lys Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro Glu Glu

450 455 460

Ser Phe Arg Phe Gly Glu Glu Ala Thr Thr Pro Ser Gln Lys Gln Asp

465 470 475 480

Pro Ile Asp Lys Glu Xaa Tyr Pro Leu Asp Ser Leu Arg Ser Leu Phe

485 490 495

Gly Asn Asp Pro Ser Ser Gln

500

<210> 407

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (389)..(389)

<223> Xaa can be any naturally occurring amino acid

<400> 407

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Gln Ala Gln Gln Ala Ala Ala Asp Ala Gly Lys Ser Lys Gln Val

115 120 125

Ser Gln Asn Phe Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys His Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Ser Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Ser Pro Ala Thr Ile Met Leu Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Xaa Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Arg Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Gly Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 408

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (76)..(76)

<223> Xaa can be any naturally occurring amino acid

<400> 408

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Ser Ser Leu Lys Thr Gly Ser Lys Glu Leu Xaa Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Gln Ile Glu Val Arg Asp
85 90 95
Thr Thr Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Glu Gln Gln Ala Ala Ala Asp Ala Gly Asn Arg
115 120 125
Asn Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln
130 135 140

Met Val His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160
Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser
165 170 175
Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190
Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly
210 215 220
Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240
Gly Thr Thr Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn
245 250 255
Pro Pro Ile Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly
260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile
275 280 285
Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300
Lys Val Leu Arg Ala Glu Gln Gly Ser Gln Glu Val Lys Asn Trp Met
305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile
325 330 335

Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350
Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu
355 360 365
Ala Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly
370 375 380
Asn Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys
385 390 395 400

Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys
405 410 415
Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg
420 425 430
Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro
435 440 445
Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu
450 455 460

Ser Phe Arg Phe Gly Glu Glu Val Thr Thr Pro Ser Gln Lys Gln Glu
465 470 475 480
Pro Ala Asp Lys Glu Gln Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe
485 490 495
Gly Asn Asp Pro Ser Ser Gln
500

<210> 409
<211> 504
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (129)..(129)
<223> Xaa can be any naturally occurring amino acid
<220><

221> misc_feature

<222> (430)..(430)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (473)..(473)

<223> Xaa can be any naturally occurring amino acid

<400> 409

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15

Glu Ser Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Arg Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Glu Ser Lys
100 105 110

Arg Lys Lys Gln Gln Ala Val Ala Asp Thr Gly Asn Ser Thr Gln Asn
115 120 125

Xaa Lys Gln Asp Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly
130 135 140

Gln Met Val His Gln Ala Met Ser Pro Arg Thr Leu Asn Ala Trp Val
145 150 155 160

Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe
165 170 175

Val Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu
180 185 190

Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr

195 200 205

Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala

210 215 220

Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile

225 230 235 240

Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser

245 250 255

Asn Pro Pro Thr Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Val Met

260 265 270

Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp

275 280 285

Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe

290 295 300

Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp

305 310 315 320

Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Arg Thr

325 330 335

Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr

340 345 350

Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala

355 360 365

Glu Ala Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg

370 375 380

Asp Asn Phe Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly

385 390 395 400

Lys Gln Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly

405 410 415

Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Xaa Asn Glu

420 425 430

Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg

435 440 445

Pro Gly Asn Phe Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu

450 455 460

Glu Ser Phe Arg Phe Gly Glu Glu Xaa Thr Thr Pro Pro Gln Lys Gln

465 470 475 480

Glu Pro Ile Asp Gln Gly Met Tyr Pro Leu Ala Ser Leu Lys Ser Leu

485 490 495

Phe Gly Asn Asp Pro Ser Ser Gln

500

<210> 410

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (42)..(42)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (95)..(95)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (164)..(164)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (218)..(218)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (258)..(258)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (268)..(268)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (271)..(271)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (293)..(293)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (344)..(344)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (473)..(474)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (479)..(479)

<223> Xaa can be any naturally occurring amino acid

<400> 410

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Gln Leu Arg Pro Gly Gly Arg Lys Arg Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Xaa Arg Phe Ala Ile Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Ile Ala Gln Leu
50 55 60

Gln Ser Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Ile Xaa Asp
85 90 95

Thr Lys Glu Ala Leu Glu Arg Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Thr Ala Asp Ile Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His
130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Xaa Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Ala Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Xaa His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Xaa Gly Glu Ile Tyr Lys Arg Trp Ile Ile Xaa Gly Leu Xaa Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Xaa Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Xaa Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Lys

370 375 380

Gly Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Arg Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Xaa Xaa Lys Gln Glu Gln Xaa Asp

465 470 475 480

Lys Glu Leu Tyr Pro Gly Ala Ser Leu Lys Ser Leu Phe Gly Ser Asp

485 490 495

Pro Leu Leu Gln

500

<210> 411

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 411

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Val Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Ala Gln Ile

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Arg Glu Ala Val Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Thr Gln Gln Ala Ala Ala Asn Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Thr Ser Ala Thr Ile Met Thr Gln Arg Gly Asn Leu Arg

370 375 380

Asn Gln Arg Lys Ser Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Lys Gly Thr Thr Thr Leu Ser Gln Lys Gln Glu Gln Lys Asp

465 470 475 480

Glu Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 412

<211> 495

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (429)..(429)

<223> Xaa can be any naturally occurring amino acid

<400> 412

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Tyr Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Gly Phe Arg Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Lys Met Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Gly Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His
130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Met His Pro Val His Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Ser Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ile Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Leu Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Xaa Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460

Glu Glu Ile Thr Ala Pro Pro Gln Arg Gln Glu Pro Ile Asp Lys Glu
465 470 475 480
Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro
485 490 495

<210> 413

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (28)..(28)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (74)..(74)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (254)..(254)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (279)..(279)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (302)..(302)

<223> Xaa can be any naturally occurring amino acid

<400> 413

Met Gly Ala Arg Ala Ser Val Leu Ser Ala Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Xaa Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Xaa Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Asn Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Met His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Xaa Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Xaa Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Xaa Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Pro Gly Thr Ile Met Met Gln Arg Gly Asn Phe Lys
370 375 380
Asn Gln Lys Lys Ile Lys Cys Phe Asn Cys Gly Arg Glu Gly His Leu
385 390 395 400
Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415
Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe
420 425 430
Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn Phe Leu
435 440 445
Gln Asn Arg Thr Glu Pro Thr Ala Pro Pro Glu Glu Ser Leu Arg Phe
450 455 460
Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Gly Pro Ile Asp Lys

465 470 475 480
Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro
485 490 495
Ser Ser Gln

<210> 414
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (11)..(11)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (31)..(31)
<223> Xaa can be any naturally occurring amino acid
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<222> (55)..(55)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (197)..(197)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (229)..(229)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (298)..(298)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (349)..(349)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (364)..(364)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (381)..(381)

<223> Xaa can be any naturally occurring amino acid

<400> 414

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Xaa Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Xaa Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Xaa Gly Cys Lys Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Val Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His

130 135 140

Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Xaa Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Xaa Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Xaa Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Xaa Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Xaa Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Xaa Asn Phe Arg

370 375 380

Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ala Gln Lys Gln Glu Pro Val Asp

465 470 475 480

Lys Glu Leu Tyr Pro Ser Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 415

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (96)..(96)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (329)..(329)

<223> Xaa can be any naturally occurring amino acid

<400> 415

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Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1               5                  10                  15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys
            20                  25                  30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
        35                  40                  45
Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Gly Gln Leu
    50                  55                  60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65                  70                  75                  80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Xaa
                85                  90                  95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
            100                 105                 110
Lys Lys Val Gln Gln Ala Gln Gln Val Ala Ala Asp Thr Glu Asn Ser
        115                 120                 125
Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln
    130                 135                 140

Met Val His Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145                 150                 155                 160
Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr
                165                 170                 175
Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
            180                 185                 190
Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
        195                 200                 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Met His Pro Val His Ala Gly
    210                 215                 220
Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225                 230                 235                 240
Gly Thr Thr Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn
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245 250 255

Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly

260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile

275 280 285

Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr

290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met

305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Xaa Asn Pro Asp Cys Lys Thr Ile

325 330 335

Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala

340 345 350

Cys Gln Gly Val Gly Gly Pro Ala His Lys Ala Arg Val Leu Ala Glu

355 360 365

Ala Met Ser Gln Val Thr Asn Ser Ala Thr Ala Thr Ile Met Met Gln

370 375 380

Arg Gly Lys Val Arg Asn Gln Arg Arg Met Ile Lys Cys Phe Asn Cys

385 390 395 400

Gly Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys

405 410 415

Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr

420 425 430

Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly

435 440 445

Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro

450 455 460

Glu Glu Ser Phe Arg Phe Gly Glu Glu Ser Pro Ser Gln Lys Gln Asp

465 470 475 480

Leu Ile Asp Lys Glu Gln Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe

485 490 495

Gly Asn Asp Pro Ser Ser Gln
500

<210> 416

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 416

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Glu Lys Trp
1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Ile Asn Pro
35 40 45

Val Phe Leu Glu Thr Ala Asp Gly Cys Ile Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Ile Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Ala Thr Val Met Met Gln Lys Gly Asn Phe
370 375 380
Arg Asn Gln Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Arg Glu Gly
385 390 395 400

His Leu Ala Arg His Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys
405 410 415
Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala
420 425 430
Asn Phe Leu Gly Lys Ile Trp Ser Ser His Lys Gly Gly Arg Pro Gly
435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser
450 455 460

Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro
465 470 475 480
Ile Asp Lys Glu Val Tyr Pro Leu Thr Ala Leu Lys Ser Leu Phe Gly
485 490 495
Asn Asp Pro Ser Ser Gln
500

<210> 417
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (67)..(67)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature

<222> (144)..(144)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (246)..(246)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (385)..(385)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (464)..(464)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (477)..(477)
<223> Xaa can be any naturally occurring amino acid
<400> 417
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Xaa Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu His Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Val Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val Xaa

130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Asp Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Leu Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Xaa Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Thr Thr Val Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Xaa Gln Arg Lys Ser Val Lys Cys Phe Asn Cys Gly Arg Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Xaa

450 455 460

Phe Gly Glu Glu Thr Thr Ala Ser Ser Gln Lys Gln Xaa Pro Ile Asp

465 470 475 480

Lys Asp Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 418

<211> 498

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (25)..(25)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (155)..(155)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (204)..(204)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (215)..(215)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (224)..(224)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (253)..(253)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (336)..(336)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (340)..(340)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (388)..(388)

<223> Xaa can be any naturally occurring amino acid

<400> 418

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Xaa Lys Lys Lys Tyr Gln Leu Lys

20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Ser Lys Ile Glu Val Lys Asp

85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Ala Asp Thr Gly Asn Ser Ser Asn
115 120 125
Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val
130 135 140
His Gln Ser Leu Ser Pro Arg Thr Leu Asn Xaa Trp Val Lys Val Val

145 150 155 160
Glu Glu Lys Gly Phe Asn Pro Glu Val Ile Pro Met Phe Thr Ala Leu
165 170 175
Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190
Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Xaa Thr Ile Asn Glu
195 200 205
Glu Ala Ala Glu Trp Asp Xaa Leu His Pro Val His Ala Gly Pro Xaa

210 215 220
Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
225 230 235 240
Thr Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr Xaa Asn Pro Pro

245 250 255

Val Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln

275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Xaa

325 330 335

Ala Met Gly Xaa Gly Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Ser Gln Val Thr Asn Ser Thr Thr Ile Met Met Gln Arg Gly Asn Phe

370 375 380

Arg Lys Gln Xaa Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe

450 455 460

Ser Phe Gly Glu Glu Thr Thr Ala Pro Pro Gln Lys Gln Glu Pro Ile

465 470 475 480

Asn Lys Glu Leu Tyr Pro Ser Thr Ser Leu Arg Ser Leu Phe Gly Asn

485 490 495

Asp Pro

<210> 419

<211> 498

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (93)..(93)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (158)..(158)

<223> Xaa can be any naturally occurring amino acid

<220><221>

misc_feature

<222> (257)..(257)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (262)..(262)

<223> Xaa can be any naturally occurring amino acid

<400> 419

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Arg Lys Lys Tyr Gln Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Ile
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu His Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Xaa Val Arg Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Gln Gln Ala Ala Ala Asp Thr Gly Ser Ser Ser Gln Val Ser

115 120 125

Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln

130 135 140

Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Xaa Glu Glu

145 150 155 160

Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu

165 170 175

Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly

180 185 190

His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala

195 200 205

Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Val Ala Pro

210 215 220

Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser

225 230 235 240

Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro

245 250 255

Xaa Gly Glu Ile Tyr Xaa Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile

260 265 270

Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly Pro

275 280 285

Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg

290 295 300

Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu

305 310 315 320

Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu

325 330 335

Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val

340 345 350

Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln

355 360 365

Val Asn Ser Pro Ala Ile Met Met Gln Arg Gly Asn Phe Lys Gly Gln

370 375 380

Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile Ala

385 390 395 400

Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Lys

405 410 415

Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe Leu

420 425 430

Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn Phe Leu Gln

435 440 445

Asn Arg Thr Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly

450 455 460

Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Asp Gln Lys Asp Lys Glu

465 470 475 480

Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Ser Asp Pro Ser

485 490 495

Ser Gln

<210> 420

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 420

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Lys Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His
130 135 140
Gln Pro Ile Ala Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Ile Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Leu Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Met Thr Trp Ile Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Lys Gln Arg Lys Ile Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Lys Thr Ile Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480
Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 421
<211> 502
<212> PRT
<213> Human immunodeficiency virus

<400> 421

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Phe Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ser His Lys Ala Lys Ile Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Ser Ala Ser Ala Ser Ile Met Met Gln Arg Gly Asn
370 375 380
Phe Arg Asn Gln Lys Arg Val Ile Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400
Gly His Leu Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp
405 410 415
Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln
420 425 430

Ala Asn Phe Leu Gly Arg Ile Trp Pro Ser Leu Lys Gly Arg Pro Gly
435 440 445
Asn Phe Leu Gln Asn Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser
450 455 460
Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro
465 470 475 480
Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln
500

<210> 422

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (55)..(55)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (61)..(61)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (235)..(235)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (371)..(371)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (483)..(483)

<223> Xaa can be any naturally occurring amino acid

<400> 422

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Xaa Gly Cys Arg Gln Ile Xaa Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Arg Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Asp Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Xaa Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Xaa Asn Pro Thr Thr Val Met Met Gln Arg Gly Asn Leu Arg
370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Met Asp
465 470 475 480
Lys Glu Xaa His Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 423
<211> 502
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (18)..(18)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature

<222> (47)..(47)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (55)..(55)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (62)..(62)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (68)..(68)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (84)..(84)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (88)..(88)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (122)..(122)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (125)..(125)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (173)..(173)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (186)..(186)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (216)..(216)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (246)..(246)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (256)..(256)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (283)..(283)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (286)..(286)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (298)..(298)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (302)..(302)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (309)..(309)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (337)..(337)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (357)..(357)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (366)..(366)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (457)..(457)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (500)..(500)

<223> Xaa can be any naturally occurring amino acid

<400> 423

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Xaa Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Xaa Pro
35 40 45

Gly Leu Leu Glu Thr Ser Xaa Gly Cys Arg Gln Ile Leu Xaa Gln Leu
50 55 60

Gln Pro Ala Xaa Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Xaa Leu Tyr Cys Xaa His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Arg Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Pro Ala Ala Ala Asp Xaa Gly Asn Xaa Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Xaa Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Xaa Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Met Xaa Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Xaa Ile Gly Trp Met Thr Ser Asn Pro Pro Xaa
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Xaa Asp Ile Xaa Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Xaa Arg Phe Tyr Xaa Thr Leu
290 295 300
Arg Ala Glu Gln Xaa Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Xaa Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Xaa His Lys Ala Arg Val Leu Ala Glu Xaa Met Ser
355 360 365
Gln Val Thr Asn Ser Thr Ala Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380

Asn Gln Arg Arg Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Xaa Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Glu Leu Ile Asn

465 470 475 480

Leu Asp Gln Glu Leu Tyr Pro Ser Ala Ser Leu Lys Ser Leu Phe Gly

485 490 495

Asn Asp Pro Xaa Ser Lys

500

<210> 424

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (83)..(83)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (138)..(138)

<223> Xaa can be any naturally occurring amino acid

<400> 424

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Xaa Thr Leu Tyr Cys Val His Gln Arg Ile Glu Ile Gln Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Val Ala Ala Asp Thr Gly Asn Ser Ser Gln Ala

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Xaa Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Asp Trp Met Thr His Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365
Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Lys Phe Lys

370 375 380

Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Leu Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Leu Ser Gln Lys Gln Glu Ser Ile Asp

465 470 475 480

Lys Glu Leu His Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 425

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 425

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110
Arg Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Pro Gln Gly Gln Met Ile His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Thr Asn Ala Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Ile Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Leu Ala Lys Asn Cys Lys Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe

435 440 445

Pro Gln Ser Arg Leu Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Lys Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Ser Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 426

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 426

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Lys Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Lys Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Arg

100 105 110

Glu Lys Ala Gln Leu Ala Ala Ala Asp Thr Gly Asn Ser Ser Pro Ala

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Ala Val His

130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Ile Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Lys Lys Val Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Arg Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Val Gly Glu Glu Thr Ala Thr Pro Ser Gln Arg Gln Glu Thr Ile Asp

465 470 475 480

Lys Glu Leu Cys Pro Leu Pro Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 427

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 427

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Arg Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Gln Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Val Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Asn
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Val Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Ile Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Asp Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Met Met Met Gln Arg Gly Asn Tyr Arg

370 375 380

His Gln Lys Lys Ile Val Lys Cys Phe Asn Cys Gly Arg Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Thr Ser Gln Lys Gln Lys Gln Glu Thr

465 470 475 480

Val Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln

500

<210> 428

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (412)..(412)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (427)..(427)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (431)..(431)

<223> Xaa can be any naturally occurring amino acid

<220

><221> misc_feature

<222> (437)..(437)

<223> Xaa can be any naturally occurring amino acid

<400> 428

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Ser Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Lys Val

115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Val Gln Gly Gln Met Val His
130 135 140
Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Met His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile

245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Thr Thr Ile Met Met Gln Arg Gly Thr Leu Arg

370 375 380

Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Xaa Cys Trp Lys Cys

405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Xaa Glu Arg Gln Xaa Asn

420 425 430

Phe Leu Gly Lys Xaa Trp Pro Ser Arg Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Pro Pro Ser Gln Lys Gln Glu Leu Ile Asp

465 470 475 480

Lys Glu Ala Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 429

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (464)..(464)

<223> Xaa can be any naturally occurring amino acid

<400> 429

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gly Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Pro Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Val Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His

130 135 140

Gln Ala Met Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Arg Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365
Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Gly Arg
370 375 380
Thr Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Xaa
450 455 460
Phe Gly Asp Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480
Lys Asp Leu Tyr Pro Ser Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495
Pro Ser Ser Gln

500

<210> 430

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<400> 430

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Gly Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Leu Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Asn Ser
115 120 125

Lys Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140

Val His Gln Ser Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160

Ile Glu Glu Lys Ala Phe Ser Pro Glu Ile Ile Pro Met Phe Thr Ala

165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Val His Pro Val Gln Ala Gly Pro

210 215 220

Val Ala Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro

245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys His Ile Leu

325 330 335

Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Val Thr Asn Pro Thr Thr Ile Met Met Gln Arg Gly Asn

370 375 380

Phe Lys Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Thr Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe

450 455 460

Arg Phe Gly Glu Gly Thr Ala Thr Pro Ser Gln Lys Gln Gly Pro Ile

465 470 475 480

Asp Glu Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn

485 490 495

Asp Pro Ser Ser Gln

500

<210> 431

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (76)..(76)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (147)..(147)

<223> Xaa can be any naturally occurring amino acid

<400> 431

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Ser Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Ala Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Xaa Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Arg Ile Glu Glu Glu Gln Asn Arg Ser Lys

100 105 110

Lys Arg Ala Gln Gln Ala Ala Ala Asp Thr Gly Ser Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His
130 135 140

Gln Pro Xaa Thr Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Asp Trp Met Thr His Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Asn Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Lys Gln Arg Lys Val Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Gln Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Ile Thr Thr Pro Ser Gln Lys Gln Glu Pro Leu Asp

465 470 475 480

Lys Glu Met Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 432

<211> 497

<212> PRT

<213> Human immunodeficiency virus

<400> 432

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Asn Lys Lys Tyr Lys Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Gln Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Val Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

His Val Thr Ser Pro Ala Asn Val Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Leu Ala Asp

465 470 475 480

Lys Glu Gln Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro

<210> 433

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 433

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Asn Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His

130 135 140

Gln Pro Met Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Ala Trp Ile Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gln Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Asn Ile Met Met Gln Arg Gly Asn Phe Lys

370 375 380

Asn Gln Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Ser Thr Pro Ser Gln Lys Gln Glu Ser Ile Asp

465 470 475 480

Arg Asp Lys Asp Met Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln

500

<210> 434

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 434

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Lys Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Pro Met Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ala
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Thr Asn Ser Thr Thr Val Met Met Gln Arg Gly Lys Phe Arg

370 375 380

Asn Gln Thr Lys Pro Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Lys Thr Thr Pro Ser Gln Lys Gln Glu Thr Ile Asp

465 470 475 480

Gln Asp Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 435

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 435

Met Gly Ala Arg Ala Ser Val Ile Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Ser Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Thr Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 436

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<400> 436

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His His Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Asp Thr Gly Asn Ser Ser Lys Val Ser
115 120 125
Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln
130 135 140
Ala Met Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu

145 150 155 160
Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu
165 170 175
Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Ile Gly Gly
180 185 190
His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala
195 200 205
Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Ile Ala Pro

210 215 220
Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser
225 230 235 240
Asn Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile Pro
245 250 255
Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile
260 265 270
Val Arg Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile Lys Gln Gly Pro

275 280 285
Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg
290 295 300
Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu
305 310 315 320
Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu
325 330 335
Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val

340 345 350

Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln

355 360 365

Met Thr Asn Pro Ala Thr Ile Met Met Gln Arg Gly Asn Phe Lys Asn

370 375 380

Gln Arg Lys Ser Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile

385 390 395 400

Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415

Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe

450 455 460

Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp Gln

465 470 475 480

Glu Arg Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro

485 490 495

Ser Ser Gln

<210> 437

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (28)..(28)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (118)..(118)

<223> Xaa can be any naturally occurring amino acid

<220

><221> misc_feature

<222> (136)..(136)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (172)..(172)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (204)..(204)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (228)..(228)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (235)..(235)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (288)..(288)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (298)..(298)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (345)..(345)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (388)..(388)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (411)..(411)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (478)..(478)

<223> Xaa can be any naturally occurring amino acid

<400> 437

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Xaa Tyr Arg Leu Lys
20 25 30
His Val Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Arg Ile Leu Glu Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Arg Lys Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Arg Ala Gln Gln Xaa Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Xaa Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Met Thr Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Xaa Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Xaa Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Xaa Arg Glu Pro Arg Gly Ser Xaa Ile Ala Gly Thr Thr
225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile Lys Gln Xaa

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Xaa Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Xaa Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Ser Val Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Xaa Pro Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Xaa Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Xaa Ile Asp

465 470 475 480

Lys Asp Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln
500

<210> 438

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 438

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Ile Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Gly Ala Gly Thr Ser Gln Val Ser
115 120 125

Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln
130 135 140

Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu
145 150 155 160

Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu
165 170 175

Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly
180 185 190

His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala

195 200 205

Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala Pro

210 215 220

Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser

225 230 235 240

Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro

245 250 255

Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile

260 265 270

Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly Pro

275 280 285

Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg

290 295 300

Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr Leu

305 310 315 320

Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu

325 330 335

Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val

340 345 350

Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln

355 360 365

Thr Thr Asn Ala Ala Ala Ala Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Gln Glu Gly His Gln Met Lys Asp Cys Thr Gly Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Ala Pro Pro Gln Lys Gln Glu Pro Ile Asp
465 470 475 480
Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Ser Asp
485 490 495

Pro Ser Ser Gln
500

<210> 439
<211> 504
<212> PRT
<213> Human immunodeficiency virus
<400> 439
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Ser Lys Lys Lys Tyr Gln Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gly Lys
115 120 125
Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val
130 135 140
His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val

145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu

165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val

180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu

195 200 205

Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile

210 215 220

Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr

225 230 235 240

Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro

245 250 255

Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln

275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys

325 330 335

Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Ser His Lys Ala Lys Ile Met Ala Glu Ala Met

355 360 365

Ser Gln Val Thr Asn Ser Thr Ala Ile Met Met Gln Arg Gly Asn Phe

370 375 380

Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys
405 410 415
Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala
420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser Ser Arg Gly Arg Pro Gly Asn
435 440 445
Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Ser Ala Pro Pro Ala
450 455 460
Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln
465 470 475 480
Glu Pro Thr Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu
485 490 495

Phe Gly Asn Asp Pro Ser Ser Gln
500

<210> 440
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<400> 440
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Met Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Ala Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Arg Ser Lys

100 105 110

Lys Thr Ala Gln Gln Ala Ala Ala Gly Thr Gly Asn Ser Ser Gln Ala
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Val Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Arg Asp
465 470 475 480
Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 441
<211> 501
<212> PRT
<213> Human immunodeficiency virus
<400> 441
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Asn Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Thr Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Ser Gln
115 120 125
Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val
130 135 140
His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val
145 150 155 160
Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Val Ala Leu
165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190
Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu
195 200 205
Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Asn
210 215 220
Pro Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
225 230 235 240

Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro
245 250 255
Ile Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Ile Gly Leu Asn
260 265 270
Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln
275 280 285
Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu
305 310 315 320
Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys
325 330 335
Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln
340 345 350
Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met
355 360 365

Ser Gln Val Thr Asn Ser Thr Thr Val Met Met Gln Lys Gly Asn Phe
370 375 380
Arg Asn Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly
385 390 395 400
His Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys
405 410 415
Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala
420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn
435 440 445
Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe
450 455 460
Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Pro Glu Pro Ile
465 470 475 480
Asp Lys Glu Val Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn
485 490 495

Asp Pro Ser Ser Gln
500

<210> 442
<211> 503
<212> PRT
<213> Human immunodeficiency virus

<400> 442

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Pro Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

His Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Gly Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Arg Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Arg Val
115 120 125

Ser His Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ser His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser
355 360 365

Gln Ala Thr Asn Ser Ala Ala Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Ser Gln Gly Lys Ser Val Lys Cys Phe Asn Cys Gly Lys Ile Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Asp Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Thr Thr Pro Pro Gln Lys Gln Glu
465 470 475 480
Pro Ile Asp Lys Glu Leu Tyr Pro Ser Ala Ser Leu Lys Ser Leu Phe

485 490 495

Gly Ser Asp Pro Ser Ser Ile
500

<210> 443
<211> 506
<212> PRT
<213> Human immunodeficiency virus
<400> 443

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Ile Ala Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Lys Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Val Gln Gln Ala Ala Ala Ala Ala Ala Ala Asp Thr Gly Asn
115 120 125
Ser Ser His Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly
130 135 140
Gln Met Val His Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val
145 150 155 160
Lys Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe
165 170 175

Thr Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu

180 185 190

Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr

195 200 205

Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala

210 215 220

Gly Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile

225 230 235 240

Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn

245 250 255

Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu

260 265 270

Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp

275 280 285

Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe

290 295 300

Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp

305 310 315 320

Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr

325 330 335

Ile Leu Lys Ala Leu Gly Gln Gly Ala Thr Leu Glu Glu Met Met Ser

340 345 350

Ala Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Ile Leu Ala

355 360 365

Glu Ala Met Ser Gln Val Thr Asn Pro Ala Asn Ile Leu Met Gln Arg

370 375 380

Gly Asn Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly

385 390 395 400

Lys Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly

405 410 415

Cys Trp Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu

420 425 430

Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Pro Tyr Lys Gly Arg
435 440 445

Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Ser Ala
450 455 460

Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Pro Ser Gln
465 470 475 480

Lys Gln Glu Gln Ile Asp Lys Glu Leu Tyr Pro Ser Ala Ser Leu Arg
485 490 495

Ser Leu Phe Gly Asn Asp Pro Leu Ser Gln
500 505

<210> 444

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<400> 444

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Ser Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Arg Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys
100 105 110

Gln Lys Val Gln Gln Ala Ala Ala Ala Asp Thr Gly Asn Ser Ser Asn
115 120 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met

130 135 140

Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala

165 170 175

Leu Ser Glu Gly Ala Thr Pro Ser Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn

195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro

210 215 220

Val Ala Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro

245 250 255

Pro Ile Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Val Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Val Thr Asn Ser Thr Ala Ile Met Met Gln Arg Gly Asn

370 375 380

Phe Arg Gly Pro Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400
Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp
405 410 415
Lys Cys Gly Lys Glu Gly His Gln Met Arg Asp Cys Asn Asn Glu Arg
420 425 430

Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Glu Arg Pro
435 440 445
Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu
450 455 460
Ser Phe Arg Phe Gly Glu Glu Thr Ala Thr Pro Ala Gln Lys Pro Glu
465 470 475 480
Pro Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe
485 490 495

Gly Asn Asp Pro Ser Ser Gln
500

<210> 445
<211> 502
<212> PRT
<213> Human immunodeficiency virus
<400> 445
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30
His Val Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
His Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80
Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Arg Ala Pro Gln Thr Ala Ala Ala Ala Asp Thr Gly Asn Ser Ser

115 120 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met

130 135 140

Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala

165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn

195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro

210 215 220

Asn Pro Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro

245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Val Ile Leu Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Arg Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350
Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365

Met Ser Gln Ala Thr Asn Ser Val Asn Ile Met Met Gln Arg Gly Asn
370 375 380
Leu Arg Asn Gln Arg Lys Met Ala Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400
Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp
405 410 415
Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln
420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly
435 440 445
Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser
450 455 460
Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Pro Glu Thr
465 470 475 480
Ile Asp Lys Glu Val Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly
485 490 495

Asn Asp Pro Ser Ser Gln
500

<210> 446
<211> 505
<212> PRT
<213> Human immunodeficiency virus
<400> 446
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1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Asn Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Pro Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Gln Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gly Asn
115 120 125
Asn Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ala Gln Gly
130 135 140
Gln Met Val His Gln Ala Ile Thr Pro Arg Thr Leu Asn Ala Trp Val
145 150 155 160
Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe
165 170 175

Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu
180 185 190
Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr
195 200 205
Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala
210 215 220
Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile
225 230 235 240

Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His
245 250 255
Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu
260 265 270
Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp
275 280 285

Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe
290 295 300

Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp
305 310 315 320
Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr
325 330 335
Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr
340 345 350
Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala
355 360 365

Glu Ala Met Ser Gln Val Thr Asn Ser Ser Asn Ile Met Met Gln Arg
370 375 380
Gly Asn Phe Arg Asn Gln Arg Arg Val Val Lys Cys Phe Asn Cys Gly
385 390 395 400
Lys Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly
405 410 415
Cys Trp Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu
420 425 430

Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg
435 440 445
Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Leu Glu Pro
450 455 460
Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Gly Thr Ala Thr
465 470 475 480
Pro Ser Gln Glu Gln Glu Lys Leu Tyr Pro Leu Thr Ser Leu Lys Ser
485 490 495

Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 447
<211> 510
<212> PRT

<213> Human immunodeficiency virus

<400> 447

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Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Thr Tyr Lys Leu Lys
            20                  25                  30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
        35                  40                  45

Cys Leu Leu Glu Thr Ser Thr Gly Cys Arg Gln Ile Leu Gly Gln Leu
    50                  55                  60
His Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65                  70                  75                  80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Ile Lys Asp
                85                  90                  95
Thr Lys Asp Ala Leu Asp Arg Ile Glu Glu Glu Gln Asn Lys Ser Lys
            100                 105                 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Asp Thr Gly Cys Ser Ser Gln
        115                 120                 125
Ala Ser Ser Ser Gln Ala Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu
    130                 135                 140
Gln Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala
145                 150                 155                 160
Trp Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro
                165                 170                 175

Met Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr
            180                 185                 190
Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys
        195                 200                 205
Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val
    210                 215                 220
His Ala Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser
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225 230 235 240

Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met
245 250 255
Thr Asn Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile
260 265 270
Ile Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile
275 280 285
Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp
290 295 300

Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys
305 310 315 320
Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys
325 330 335
Lys Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met
340 345 350
Met Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val
355 360 365

Leu Ala Glu Ala Met Ser Gln Ala Thr Asn Ala Ala Ala Val Met Met
370 375 380
Gln Lys Gly Asn Phe Arg Gly Gln Arg Lys Thr Val Lys Cys Phe Asn
385 390 395 400
Cys Gly Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys
405 410 415
Arg Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys
420 425 430

Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys
435 440 445
Gly Arg Pro Gly Asn Phe Leu Gln Asn Arg Pro Glu Pro Thr Val Pro
450 455 460
Thr Ala Pro Pro Ala Glu Ser Phe Arg Phe Gly Glu Glu Thr Ala Thr
465 470 475 480

Pro Ser Gln Lys Gln Glu Pro Ile Asp Lys Glu Leu Tyr Pro Pro Leu
485 490 495

Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505 510

<210> 448

<211> 500

<212> PRT

<213> Human immunodeficiency virus

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

<400> 448

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1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Lys Tyr Gln Leu Lys
20 25 30
His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Ser Gly Cys Arg Gln Ile Leu Arg Gln Leu
50 55 60

Gln Pro Ala Leu Glu Thr Gly Ser Glu Glu Xaa Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Xaa Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys
100 105 110
Glu Lys Xaa Gln Gln Ala Ala Ala Ala Thr Gly Xaa Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Xaa Asn Xaa Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Xaa Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Xaa His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Xaa Trp Met Thr His Asn Pro Pro Ile
245 250 255

Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Ile Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Xaa Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Xaa Leu Lys Xaa

325 330 335

Leu Gly Pro Ala Ala Thr Leu Xaa Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Xaa Thr Asn Ser Xaa Asn Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Pro Arg Lys Ser Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Lys Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Xaa Arg Pro Gly Asn Xaa

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Xaa Arg

450 455 460

Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Gly Thr Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 449

<211> 502

<212> PRT

<213> Human immunodeficiency virus

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<223> Xaa can be any naturally occurring amino acid
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<400> 449

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Glu Lys Ile Gln Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys

20 25 30
His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Glu Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Ile Tyr Cys Val His Lys Arg Ile Asp Val Arg Asp

85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Xaa Ala Gln Gln Ala Ala Ala Ala Ala Ala Gly Pro Gly Asn Ser
115 120 125
Gln Val Ser Xaa Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met
130 135 140
Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Xaa Ile Pro Met Phe Ser Ala
165 170 175
Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Xaa Asn Thr
180 185 190
Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205
Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro

210 215 220
Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240
Thr Thr Ser Thr Leu Gln Glu Gln Ile Asn Trp Met Thr Asn Asn Pro
245 250 255
Pro Ile Pro Val Gly Glu Xaa Tyr Lys Arg Trp Ile Ile Leu Gly Leu
260 265 270
Xaa Lys Ile Val Arg Met Tyr Xaa Pro Ala Ser Ile Leu Asp Ile Arg

275 280 285
Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Xaa Asp Arg Phe Tyr Lys
290 295 300
Thr Leu Arg Ala Glu Gln Ala Ser Gln Xaa Val Lys Asn Trp Met Thr
305 310 315 320
Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335
Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350
Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365
Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn
370 375 380
Phe Arg Asn Gln Arg Lys Xaa Val Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400
Xaa His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp

405 410 415

Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Xaa Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser

450 455 460

Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Gly Pro

465 470 475 480

Met Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly

485 490 495

Xaa Asp Pro Ser Ser Gln

500

<210> 450

<211> 508

<212> PRT

<213> Human immunodeficiency virus

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

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<400> 450

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Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Pro Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Met Ile Glu Ile Arg Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Xaa Gln Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Thr Ala Asp Ala Gly Lys Thr Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His

130 135 140

Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Gly Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Xaa Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro Pro Ile

245 250 255

Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Xaa Asn Pro Asp Xaa Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Tyr Xaa

370 375 380

Asn Gln Gly Lys Met Val Lys Cys Phe Asn Cys Gly Lys Xaa Gly His
385 390 395 400
Ile Ala Arg Asn Xaa Arg Ala Pro Xaa Lys Lys Gly Cys Trp Lys Cys

405 410 415
Gly Lys Glu Gly His Gln Xaa Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Asn Arg Pro Glu Pro Ala Ala Pro Gln Asn Arg Thr Glu Pro
450 455 460
Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Xaa Ile Thr

465 470 475 480
Pro Ser Gln Lys Gln Glu Pro Ile Asp Arg Glu Tyr Pro Leu Ala Ser
485 490 495
Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 451
<211> 507
<212> PRT
<213> Human immunodeficiency virus
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Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Gln Trp
1 5 10 15

Glu Lys Ile Tyr Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Arg Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ile Lys
100 105 110
Lys Lys Thr Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Pro Ile Ser Ala Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Ala Gln Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Val
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
His Val Thr Asn Ser Asn Ala Ile Met Met Gln Arg Gly Asn Phe Lys
370 375 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Pro Thr Ala
450 455 460

Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Gly Ala Thr Ala Pro Pro
465 470 475 480
Gln Lys Gln Glu Pro Ile Asp Lys Glu Met Tyr Pro Leu Val Ser Leu
485 490 495
Arg Ser Leu Phe Gly Ser Asp Pro Ser Ser Gln
500 505

<210> 452
<211> 497
<212> PRT
<213> Human immunodeficiency virus
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<222> (444)..(444)

<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

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<400> 452

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Xaa Arg Pro Gly Gly Lys Lys Gln Tyr Arg Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Ile Asn Pro
35 40 45

Gly Leu Leu Xaa Thr Ser Glu Gly Cys Arg Gln Ile Leu Arg His Leu
50 55 60

His Ser Ser Leu Gln Ala Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Xaa Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Xaa Val Xaa Asn Xaa Gln Gly Gln Met Xaa Tyr

130 135 140

Gln Xaa Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gly Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu Xaa Pro Val Gln Ala Gly Pro Ile Ala
210 215 220
Pro Gly Xaa Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Xaa Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Xaa Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Ala Ile Leu Arg Ala
325 330 335
Leu Gly Pro Ala Ala Xaa Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Gln Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Xaa Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Xaa Pro Gly Asn Phe
435 440 445
Pro Gln Ser Xaa Thr Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Val Pro Ser Gln Lys Gln Glu Leu Ile Xaa
465 470 475 480
Lys Asn Leu Tyr Pro Ser Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495

Pro

<210> 453
<211> 502
<212> PRT
<213> Human immunodeficiency virus
<400> 453
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Arg Leu Asp Gln Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Lys Ile Leu Gly Gln Leu

50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Ile Ala Val Leu Tyr Cys Val His Gln Gly Thr Gln Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Ala Gly Asn Asn Ser

115 120 125

Pro Val Ser Gln Asn Phe Pro Ile Val Gln Asn Leu Gln Gly Gln Met

130 135 140

Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala

165 170 175

Leu Ala Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn

195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro

210 215 220

Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro

245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350
Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Ile Leu Ala Glu Ala
355 360 365
Met Ser Gln Val Thr Asn Pro Thr Asn Ile Leu Met Gln Arg Gly Asn

370 375 380
Phe Lys Asn Gln Arg Arg Ser Val Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400
Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp
405 410 415
Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln
420 425 430
Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly

435 440 445
Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser
450 455 460
Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Lys
465 470 475 480
Ile Asp Lys Glu Met Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly
485 490 495
Asn Asp Pro Ser Ser Gln
500

<210> 454
<211> 503
<212> PRT
<213> Human immunodeficiency virus
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<222> (15)..(15)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (49)..(49)
<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (98)..(98)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (113)..(113)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (115)..(115)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

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<220><221> misc_feature

<222> (143)..(143)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (166)..(166)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (184)..(184)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (188)..(188)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (290)..(290)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (378)..(378)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (387)..(387)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (390)..(390)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (392)..(392)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (420)..(420)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (449)..(449)

<223> Xaa can be any naturally occurring amino acid

<400> 454

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Xaa Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys
20 25 30

His Ile Val Trp Ala Ser Lys Glu Leu Glu His Phe Ala Leu Asn Pro
35 40 45

Xaa Leu Leu Glu Thr Thr Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Arg Thr Gly Thr Gln Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Ile Lys Asp
85 90 95

Thr Xaa Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Xaa Lys Xaa Gln Gln Ala Ala Ala Asp Thr Gly Lys Asp Asn Pro Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Xaa Ala Gln Gly Gln Met Xaa His
130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Xaa Glu Val Ile Pro Met Phe Ala Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Xaa Asn Thr Met Xaa Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Ile Gly Leu His Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285

Pro Xaa Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Ser Ala Asn Xaa Met Met Gln Lys Gly Asn
370 375 380
Phe Arg Xaa Gln Arg Xaa Ile Xaa Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400

Gly His Ile Ala Arg Asn Cys Lys Ala Pro Arg Arg Lys Gly Cys Trp
405 410 415

Lys Cys Gly Xaa Glu Gly His Gln Leu Lys Asp Cys Thr Glu Arg Gln
420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly
435 440 445

Xaa Phe Pro Gln Ser Arg Leu Glu Pro Thr Ala Pro Pro Glu Glu Ser
450 455 460

Phe Arg Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Glu Ser
465 470 475 480

Arg Asp Lys Glu Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe
485 490 495

Gly Asn Asp Pro Ser Ser Gln
500

<210> 455

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (114)..(114)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (152)..(152)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (245)..(245)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (350)..(350)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (369)..(369)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (427)..(427)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (461)..(461)

<223> Xaa can be any naturally occurring amino acid

<400> 455

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Gln Leu Arg Pro Gly Gly Lys Lys Arg Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Lys Ile Leu Val Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Gly Val Asp Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Xaa Ala Gln Ala Ala Ala Ala Asp Thr Gly Asn Asn Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Xaa Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Ile Ile Pro Met Phe Thr Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Val Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Xaa Gln Ile Ala Trp Met Thr His Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Ser Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Xaa Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Xaa Phe Thr Asn Pro Ala Asn Ile Met Met Gln Arg Gly Asn Phe Lys

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Xaa Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Xaa Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Ser Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 456

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 456

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Lys Tyr Lys Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asp Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Lys Thr Gly Ser Glu Glu Phe Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Asn Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Gly Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Arg Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Met Thr Asn Gln Ala Thr Ile Met Val Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Gly Arg Asn Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Asn Leu Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 457

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 457

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Ser Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Asp Ala Gly Thr Ser Ser Gln Val Ser
115 120 125
Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His Gln

130 135 140
Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu
145 150 155 160
Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu
165 170 175
Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly
180 185 190
His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala

195 200 205
Ala Asp Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala Pro
210 215 220
Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser
225 230 235 240
Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro
245 250 255
Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile

260 265 270
Val Arg Met Tyr Ser Pro Ala Ser Ile Leu Asp Ile Arg Gln Gly Pro
275 280 285
Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg
290 295 300
Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu
305 310 315 320
Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu

325 330 335

Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val

340 345 350

Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln

355 360 365

Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg Asn

370 375 380

Gln Arg Lys Ala Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Val

385 390 395 400

Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys Gly

405 410 415

Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Pro

435 440 445

Gln Ser Arg Leu Met Pro Thr Ala Pro Pro Ala Pro Pro Glu Glu Ser

450 455 460

Phe Arg Phe Gly Glu Glu Ala Thr Thr Pro Ser Gln Arg Gln Glu Pro

465 470 475 480

Ile Asp Lys Glu His Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln

500

<210> 458

<211> 507

<212> PRT

<213> Human immunodeficiency virus

<400> 458

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Ser Lys Arg Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Arg Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80
Thr Val Ala Thr Ile Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Glu Gln Asn Lys Ser Lys Glu Lys Ala Gln Gln Ala Ala Ala Gly Thr
115 120 125
Gly Asn Ser Ser Gln Val Ser Ser Gln Asn Tyr Pro Ile Val Gln Asn

130 135 140
Leu Gln Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn
145 150 155 160
Ala Trp Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile
165 170 175
Pro Met Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Ser Asp Leu Asn
180 185 190
Thr Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu

195 200 205
Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro
210 215 220
Val His Ala Gly Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly
225 230 235 240
Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp
245 250 255
Met Thr Ser Asn Pro Pro Ile Pro Val Gly Asp Ile Tyr Lys Arg Trp

260 265 270
Ile Ile Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser

275 280 285

Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val

290 295 300

Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val

305 310 315 320

Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp

325 330 335

Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu

340 345 350

Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg

355 360 365

Val Leu Ala Glu Ala Met Ser Gln Val Thr Asn Ser Ala Asn Ile Met

370 375 380

Met Gln Arg Gly Asn Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe

385 390 395 400

Asn Cys Gly Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg

405 410 415

Lys Lys Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp

420 425 430

Cys Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His

435 440 445

Lys Gly Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala

450 455 460

Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser

465 470 475 480

Gln Lys Gln Asp Pro Ile Asp Lys Asp Leu Tyr Pro Leu Ala Ser Leu

485 490 495

Arg Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505

<210> 459

<211> 505

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (28)..(28)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (113)..(113)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (115)..(115)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (151)..(151)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (156)..(156)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (238)..(238)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (271)..(271)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (274)..(274)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (282)..(282)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (306)..(306)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (309)..(309)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (314)..(314)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (325)..(325)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (340)..(340)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (347)..(347)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (480)..(480)

<223> Xaa can be any naturally occurring amino acid

<400> 459

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Gln Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Xaa Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Val Leu Phe Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Xaa Lys Xaa Gln Gln Ala Ala Ala Asp Thr Gly Asn Thr Gly Asn Ser

115 120 125

Asn Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln

130 135 140

Met Val His Gln Ala Ile Xaa Pro Arg Thr Leu Xaa Ala Trp Val Lys

145 150 155 160

Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser

165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn

180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile

195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly

210 215 220

Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Xaa Ile Ala

225 230 235 240

Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn

245 250 255

Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Xaa Gly

260 265 270

Leu Xaa Lys Ile Val Arg Met Tyr Ser Xaa Thr Ser Ile Leu Asp Ile

275 280 285

Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr

290 295 300

Lys Xaa Leu Arg Xaa Glu Gln Ala Ser Xaa Glu Val Lys Asn Trp Met

305 310 315 320

Thr Glu Thr Leu Xaa Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile

325 330 335

Leu Lys Ala Xaa Gly Pro Ala Ala Thr Leu Xaa Glu Met Met Thr Ala

340 345 350

Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu

355 360 365

Ala Met Ser Gln Val His Pro Val Asn Ile Met Met Gln Arg Gly Asn

370 375 380

Phe Lys Asn Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu

385 390 395 400

Gly His Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro

450 455 460

Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Xaa

465 470 475 480

Gln Glu Pro Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser

485 490 495

Leu Phe Gly Asn Asp Pro Leu Ser Gln

500 505

<210> 460

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (53)..(53)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (224)..(224)

<223> Xaa can be any naturally occurring amino acid

<400> 460

Met Gly Ala Arg Ala Ser Ile Leu Arg Gly Glu Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Gln Leu Arg Pro Gly Gly Lys Lys Arg Tyr Gln Leu Lys
20 25 30

His Leu Ile Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Xaa Ser Ala Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Ser Ser Leu Gln Thr Gly Thr Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Val Glu Glu Glu Gln Asn Lys Gly Lys
100 105 110
Val Lys Thr Gln Gln Ala Ala Ala Asp Thr Gly Ser Ser Ser Lys Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Pro Leu Thr Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Xaa
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Ile Ile Leu Lys Ser

325 330 335

Leu Gly Pro Gly Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Asn Thr Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Asn Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Pro Pro Ser Gln Lys Gln Glu Gln Thr Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 461

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (226)..(226)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (444)..(444)

<223> Xaa can be any naturally occurring amino acid

<400> 461

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Gly Arg Glu Leu Glu Arg Tyr Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Met Glu Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Ile Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser Ser

115 120 125

Lys Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Phe Gln Gly Gln Met

130 135 140

Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala

165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn

195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Ala Gln Ala Gly Pro

210 215 220

Val Xaa Pro Gly Gln Ile Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Asp Trp Met Thr Arg Asn Pro

245 250 255

Pro Val Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn

370 375 380

Phe Arg Asn Gln Lys Lys Asn Val Lys Cys Phe Asn Cys Gly Lys Glu

385 390 395 400

Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp

405 410 415

Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Xaa Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser

450 455 460

Phe Arg Phe Gly Glu Gly Thr Thr Thr Pro Pro Gln Lys Gln Glu Thr

465 470 475 480

Ile Asp Lys Asp Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly

485 490 495

Asn Asp Pro Leu Ser Gln

500

<210> 462

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

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<220><221> misc_feature

<222> (227)..(227)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (230)..(230)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (307)..(307)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (460)..(460)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (474)..(474)

<223> Xaa can be any naturally occurring amino acid

<400> 462

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Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1               5                  10                  15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
            20                  25                  30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
        35                  40                  45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Arg Gln Leu

    50                  55                  60
Gln Pro Ala Xaa Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65                  70                  75                  80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
                85                  90                  95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asp Lys Ser Lys
            100                 105                 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

        115                 120                 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
    130                 135                 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145                 150                 155                 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
                165                 170                 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

            180                 185                 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
        195                 200                 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala
    210                 215                 220
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Pro Gly Xaa Met Arg Xaa Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Ala Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Xaa Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380
Asn Gln Arg Lys Val Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Xaa Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Ala Thr Pro Pro Xaa Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Pro

500

<210> 463

<211> 504

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (143)..(143)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (404)..(404)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (442)..(442)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (471)..(471)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (474)..(474)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (477)..(477)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (481)..(481)

<223> Xaa can be any naturally occurring amino acid

<400> 463

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Asp Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Lys Ile Leu Glu Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu His Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Arg Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Pro Ala Ala Asp Thr Gly Ser His Asn Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Xaa His
130 135 140
Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Asn Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Met His Pro Val His Ala Gly Pro Val Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Val
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Ile Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Glu Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ala His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Gln Pro Ala Ala Val Met Met Gln Arg Gly Asn Phe Lys

370 375 380

Asn Gln Lys Arg Ile Val Lys Cys Tyr Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Xaa Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Gly Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Phe Trp Pro Ser His Xaa Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Asn Ser Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro Glu Glu

450 455 460

Ser Phe Arg Phe Gly Glu Xaa Ile Ala Xaa Pro Ser Xaa Lys Gln Glu

465 470 475 480

Xaa Lys Gly Lys Glu Leu Tyr Pro Pro Leu Ala Ser Leu Arg Ser Leu

485 490 495

Phe Gly Asn Asp Pro Ser Ser Gln

500

<210> 464

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 464

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Asp Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Thr Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Arg Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His
130 135 140

Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ser Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Ile Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu His Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Thr Thr Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380
Asn His Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Asp Leu Ile Asp
465 470 475 480

Lys Glu Leu His Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 465

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (17)..(17)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (66)..(66)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (82)..(82)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (88)..(88)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (167)..(167)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (175)..(175)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (211)..(211)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (406)..(406)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
<222> (408)..(408)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (452)..(452)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (471)..(471)
<223> Xaa can be any naturally occurring amino acid
<400> 465

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15
Xaa Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Lys Tyr Gln Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Xaa Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Xaa Ala Val Leu Tyr Cys Xaa His Gln Asn Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Gln Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Ser Thr Gly Asn Ser Gly Gln Ile
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Xaa Val Ile Pro Met Phe Thr Ala Xaa Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Xaa Trp Asp Arg Ile His Pro Val His Ala Gly Pro Ile Ala

210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Arg Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Ala Thr Asn Gln Ala Ser Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ser Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Xaa Ala Xaa Arg Arg Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Xaa Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Gly Glu Thr Thr Xaa Pro Ser Gln Lys Gln Glu Gln Thr Lys

465 470 475 480

Glu Glu Leu Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 466

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<400> 466

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Ser Leu Leu Glu Thr Ala Ala Gly Cys Arg Gln Ile Leu Ala Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu His Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Arg Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Asn Ser Ser Gln
115 120 125
Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val
130 135 140
His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile

145 150 155 160
Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu
165 170 175
Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190
Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu
195 200 205
Glu Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Val

210 215 220
Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
225 230 235 240
Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro
245 250 255
Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn
260 265 270
Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln

275 280 285
Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr
290 295 300
Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu
305 310 315 320
Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys
325 330 335
Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350
Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Ser Gln Val Thr Asn Ala Asn Thr Ile Met Met Gln Arg Gly Asn Phe

370 375 380

Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Ala Glu Ser Phe

450 455 460

Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile

465 470 475 480

Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Ser

485 490 495

Asp Pro Leu Ser Gln

500

<210> 467

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (38)..(38)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (462)..(462)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (467)..(467)

<223> Xaa can be any naturally occurring amino acid

<400> 467

Met Gly Ala Arg Ala Ser Val Leu Ser Ala Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Xaa Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Gly Thr Gly Asn Ser Ser Gln Thr
115 120 125

Ser Gln Asn Phe Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Asn Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Asp Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Thr Trp Met Thr Gly Asn Pro Pro Ile
245 250 255
Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Ile Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Gly Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ala His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Ala Asn Ser Thr Thr Ile Met Met Gln Arg Gly Asn Phe Arg Gly
370 375 380
Gln Arg Lys Ile Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile
385 390 395 400
Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Arg Cys Gly
405 410 415
Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe
420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu
435 440 445
Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro Xaa Glu Ser
450 455 460
Phe Arg Xaa Gly Glu Gly Thr Thr Thr Pro Ser Gln Lys Gln Glu Thr
465 470 475 480
Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln

500

<210> 468

<211> 508

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (79)..(79)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (115)..(115)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (179)..(179)

<223> Xaa can be any naturally occurring amino acid

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<222> (189)..(189)

<223> Xaa can be any naturally occurring amino acid

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<222> (202)..(202)

<223> Xaa can be any naturally occurring amino acid

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<222> (292)..(292)

<223> Xaa can be any naturally occurring amino acid

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<222> (297)..(297)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (342)..(342)

<223> Xaa can be any naturally occurring amino acid

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<222> (395)..(395)

<223> Xaa can be any naturally occurring amino acid

<400> 468

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Glu Lys Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Xaa Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Xaa Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Thr Gly Asn
115 120 125

Ser Ser Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln
130 135 140

Gly Gln Met Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp
145 150 155 160

Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met
165 170 175

Phe Thr Xaa Leu Ser Glu Gly Ala Thr Pro Gln Asp Xaa Asn Thr Met
180 185 190

Leu Asn Thr Val Gly Gly His Gln Ala Xaa Met Gln Met Leu Lys Glu
195 200 205

Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His
210 215 220

Ala Gly Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp

225 230 235 240

Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr

245 250 255

Asn Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile

260 265 270

Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu

275 280 285

Asp Ile Lys Xaa Gly Pro Lys Glu Xaa Phe Arg Asp Tyr Val Asp Arg

290 295 300

Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn

305 310 315 320

Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys

325 330 335

Thr Ile Leu Lys Ala Xaa Gly Pro Ala Ala Thr Leu Glu Glu Met Met

340 345 350

Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu

355 360 365

Ala Glu Ala Met Ser Gln Ala Thr Asn Ser Ala Ala Ala Ile Met Met

370 375 380

Gln Arg Gly Lys Phe Lys Asn Gln Arg Lys Xaa Val Lys Cys Phe Asn

385 390 395 400

Cys Gly Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys

405 410 415

Lys Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys

420 425 430

Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys

435 440 445

Gly Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro

450 455 460

Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Ala

465 470 475 480

Pro Ser Gln Lys Gln Glu Pro Ile Asp Lys Glu Val Tyr Pro Leu Ala

485 490 495

Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Ser Ser

500 505

<210> 469

<

211> 499

<212> PRT

<213> Human immunodeficiency virus

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<223> Xaa can be any naturally occurring amino acid

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<222> (43)..(43)

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<222> (182)..(182)

<223> Xaa can be any naturally occurring amino acid

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<222> (193)..(193)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (231)..(231)

<223> Xaa can be any naturally occurring amino acid

<400> 469

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Xaa Glu Leu Glu Xaa Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Ala Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

His Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Arg Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Asp Thr Gly Asn Ser Ser Gln Val Ser

115 120 125
Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln
130 135 140
Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu
145 150 155 160
Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu
165 170 175
Gly Ala Thr Pro Gln Xaa Leu Asn Thr Met Leu Asn Thr Val Gly Gly

180 185 190
Xaa Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala
195 200 205
Ala Glu Trp Asp Arg Leu His Pro Pro Gln Ala Gly Pro Ile Ala Pro
210 215 220
Gly Gln Ile Arg Glu Pro Xaa Gly Ser Asp Ile Ala Gly Ser Thr Ser
225 230 235 240
Asn Leu Gln Glu Gln Val Arg Trp Met Thr Ser Asn Pro Pro Ile Pro

245 250 255
Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile
260 265 270
Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly Pro
275 280 285
Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Arg Thr Leu Arg
290 295 300
Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu

305 310 315 320

Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu

325 330 335

Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val

340 345 350

Gly Gly Pro Ala His Lys Ala Arg Val Leu Ala Glu Ala Met Ser His

355 360 365

Val Thr Gly Ala Asn Ala Ile Met Met Gln Lys Gly Asn Phe Lys Ser

370 375 380

Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile

385 390 395 400

Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415

Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe

450 455 460

Gly Glu Glu Ala Ala Ala Pro Pro Gln Lys Gln Glu Pro Ile Asp Lys

465 470 475 480

Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro

485 490 495

Ser Ser Gln

<210> 470

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 470

Met Gly Ala Arg Ala Ser Val Leu Ser Ala Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ala Glu Gly Cys Lys Gln Ile Leu Gly Gln Leu

50 55 60
Gln Ser Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Leu Val Ala Val Leu Trp Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Lys Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Asn Gln Val

115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255
Gln Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Pro Ala Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Pro Gln Ser Lys Ile Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 471

<211> 508
<212> PRT
<213> Human immunodeficiency virus
<400> 471

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Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Lys Trp
1               5                  10                  15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys
            20                  25                  30
His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
        35                  40                  45
Gly Leu Leu Glu Thr Ala Gly Gly Cys Arg Gln Ile Leu Gly Gln Leu

    50                  55                  60
His Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65                  70                  75                  80
Thr Ile Ala Thr Leu Tyr Cys Val His Gln Asn Ile Glu Val Lys Asp
                85                  90                  95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
            100                 105                 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Ala Asn Ser Ser Gln Val

        115                 120                 125
Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln
    130                 135                 140
Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145                 150                 155                 160
Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser
                165                 170                 175
Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn

            180                 185                 190
Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
        195                 200                 205
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Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Ala Gln Ala Gly
210 215 220
Pro Val Ala Pro Gly Gln Ile Arg Asp Pro Arg Gly Ser Asp Ile Ala
225 230 235 240
Gly Thr Thr Ser Asn Leu Gln Glu Gln Ile Thr Trp Met Thr Ser Asn

245 250 255
Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly
260 265 270
Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile
275 280 285
Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300
Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Gly Trp Met

305 310 315 320
Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile
325 330 335
Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350
Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Ile Leu Ala Glu
355 360 365
Ala Met Ser Gln Val Thr Ser Ser Ala Thr Ile Met Met Gln Arg Gly

370 375 380
Asn Phe Arg Asn Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys
385 390 395 400
Glu Gly His Leu Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys
405 410 415
Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Asn Glu Arg
420 425 430
Gln Ala Asn Phe Leu Gly Arg Ile Trp Pro Ser Ser Lys Gly Arg Pro

435 440 445
Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu

450 455 460

Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu

465 470 475 480

Leu Ile Asp Lys Glu Pro Ile Asp Lys Glu Thr Tyr Pro Leu Ala Ser

485 490 495

Leu Arg Ser Leu Phe Gly Asn Asp Pro Leu Ser Gln

500 505

<210> 472

<211> 512

<212> PRT

<213> Human immunodeficiency virus

<400> 472

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Ser Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Arg Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Ile Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Pro Ala Ala Ala Ala Asp Thr Glu Asn Ser Ser Gln

115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val

130 135 140

His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val

145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu
165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190
Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu
195 200 205
Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile
210 215 220
Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
225 230 235 240

Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro
245 250 255
Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn
260 265 270
Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln
275 280 285
Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr
290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu
305 310 315 320
Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys
325 330 335
Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln
340 345 350
Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met
355 360 365

Ser Gln Val Thr Ser Pro Ala Asn Ile Met Met Gln Arg Gly Asn Phe
370 375 380
Arg Asn Gln Arg Lys Ile Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly
385 390 395 400
His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Gln Ser Arg

450 455 460

Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg Phe Gly Glu Glu

465 470 475 480

Thr Ala Thr Pro Ser Gln Lys Gln Glu Thr Val Asp Lys Glu Val Tyr

485 490 495

Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Ser Asp Pro Leu Leu Gln

500 505 510

<210> 473

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 473

Met Gly Ala Arg Ala Ser Val Leu Arg Gly Gly Gln Leu Asp Thr Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Arg Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Ile Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Ile Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Val Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Asn Ile Glu Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Thr Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Cys Thr Pro Gln Asp Leu Asn Leu Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Met His Pro Val Gln Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Thr Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Pro Ala Ala Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

His Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Arg Arg Gly Gly Pro Gly Asn Phe

435 440 445

Pro Gln Gly Arg Leu Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Asp Pro Ile Asp

465 470 475 480

Lys Glu Met Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 474

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<400> 474

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Asn Ser Leu Ser Asn
65 70 75 80
Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110
Lys Lys Val Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Asn Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Val Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175
Glu Gly Ala Thr Pro Ser Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Ser Asn Ala Thr Asn Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Thr Gln Arg Arg Ile Val Arg Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Arg Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Ser Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Pro Pro Gln Lys Gln Glu Ala Ile Asp Lys

465 470 475 480

Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Ser Asp Pro

485 490 495

Ser Ser Gln

<210> 475

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

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<222> (26)..(26)

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<220><221> misc_feature

<222> (40)..(40)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (51)..(51)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (104)..(104)

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<220><221> misc_feature

<222> (489)..(489)

<223> Xaa can be any naturally occurring amino acid

<400> 475

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15

Glu Arg Ile Arg Leu Arg Xaa Gly Gly Xaa Lys Arg Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Xaa Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Xaa Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Ile Gln Leu
50 55 60

Gln Pro Ser Leu Lys Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Gly Ile Glu Val Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Xaa Glu Glu Glu Gln Asn Lys Gly Lys
100 105 110

Lys Lys Ala Gln Gln Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Asn
115 120 125
Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln
130 135 140
Met Val His Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160

Val Ile Glu Asp Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr
165 170 175
Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190
Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205
Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly
210 215 220

Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240
Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn
245 250 255
Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly
260 265 270
Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile
275 280 285

Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300
Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met
305 310 315 320
Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile
325 330 335
Leu Lys Ala Leu Gly Pro Gly Ala Ser Leu Glu Glu Met Met Thr Ala
340 345 350

Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu

355 360 365

Ala Met Ser Gln Ala Thr Asn Gln Asn Thr Ile Met Met Gln Arg Gly

370 375 380

Thr Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys

385 390 395 400

Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys

405 410 415

Trp Lys Cys Gly Gln Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg

420 425 430

Gln Ala Asn Phe Leu Gly Arg Ile Trp Pro Ser His Lys Gly Arg Pro

435 440 445

Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Ala Glu

450 455 460

Ser Phe Gly Phe Gly Glu Glu Gly Thr Thr Pro Pro Gln Lys Gln Glu

465 470 475 480

Gln Lys Asp Lys Glu Leu Tyr Pro Xaa Ala Ser Leu Arg Ser Leu Phe

485 490 495

Gly Asn Asp Pro

500

<210> 476

<211> 506

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (230)..(230)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (438)..(438)

<223> Xaa can be any naturally occurring amino acid

<400> 476

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp His Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser
115 120 125
Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln

130 135 140
Met Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160
Val Ile Glu Glu Arg Ala Phe Ser Pro Glu Ile Ile Pro Met Phe Ser
165 170 175
Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190
Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile

195 200 205
Asn Glu Glu Ala Ala Asp Trp Asp Arg Leu His Pro Val His Ala Gly
210 215 220
Pro Ala Ala Pro Gly Xaa Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240
Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn
245 250 255
Pro Ala Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly

260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile

275 280 285

Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr

290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met

305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile

325 330 335

Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala

340 345 350

Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Ile Leu Ala Glu

355 360 365

Ala Met Ser Gln Val Thr Asn Gln Ser Thr Ile Met Ile Gln Arg Gly

370 375 380

Asn Phe Arg Gly Gln Gly Lys Ile Val Lys Cys Phe Asn Cys Gly Lys

385 390 395 400

Val Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys

405 410 415

Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Gly

420 425 430

Gln Ala Asn Phe Leu Xaa Lys Ile Trp Pro Ser His Lys Gly Arg Pro

435 440 445

Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Pro

450 455 460

Thr Ala Pro Pro Ala Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr

465 470 475 480

Pro Ser Gln Lys Gln Glu Pro Ile Asp Lys Glu Leu Tyr Pro Leu Thr

485 490 495

Ser Leu Arg Ser Leu Phe Gly Asn Asp His

500 505

<210> 477

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (10)..(10)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (13)..(13)

<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (135)..(135)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

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222> (331)..(331)

<223> Xaa can be any naturally occurring amino acid

<400> 477

Met Gly Ala Arg Ala Ser Val Leu Ser Xaa Gly Glu Xaa Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Xaa Lys Arg Tyr Arg Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Leu Ile Xaa Asn Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Ile Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Thr Ser Gln Val

115 120 125
Ser Gln Asn Tyr Pro Ile Xaa Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Ile Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Xaa Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ile Phe Arg

450 455 460

Phe Gly Lys Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Gly Ser Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 478

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (64)..(64)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (74)..(74)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (76)..(76)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

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<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

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<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

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<222> (139)..(139)

<223> Xaa can be any naturally occurring amino acid

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<222> (220)..(220)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

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<223> Xaa can be any naturally occurring amino acid

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<222> (323)..(323)

<223> Xaa can be any naturally occurring amino acid

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<222> (377)..(377)

<223> Xaa can be any naturally occurring amino acid

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<222> (421)..(421)

<223> Xaa can be any naturally occurring amino acid

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<222> (445)..(445)

<223> Xaa can be any naturally occurring amino acid

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<222> (485)..(485)

<223> Xaa can be any naturally occurring amino acid

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<222> (489)..(489)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (492)..(492)

<223> Xaa can be any naturally occurring amino acid

<400> 478

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Gly Gln Xaa

50 55 60

His Pro Ser Leu Gln Thr Gly Ser Glu Xaa Leu Xaa Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Xaa Asn Ile Glu Val Xaa Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Gln Xaa Lys
100 105 110
Lys Lys Xaa Gln Gln Ala Ala Ala Ala Thr Gly Asn Ser Xaa Ser Xaa
115 120 125
Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Xaa Gln Gly Gln Met Val

130 135 140
His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val
145 150 155 160
Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu
165 170 175
Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190
Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu

195 200 205
Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val Xaa Ala Gly Pro Val
210 215 220
Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
225 230 235 240
Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro
245 250 255
Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn

260 265 270
Lys Ile Val Arg Met Tyr Ser Pro Ala Ser Ile Leu Asp Ile Arg Gln
275 280 285
Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr
290 295 300
Leu Arg Xaa Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu
305 310 315 320
Thr Leu Xaa Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys

325 330 335
Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Ser Gln Val Thr Asn Ser Ala Asn Xaa Ile Met Met Gln Arg Gly Asn

370 375 380

Phe Arg Asn Gln Arg Lys Asn Val Lys Cys Phe Asn Cys Gly Lys Glu

385 390 395 400

Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp

405 410 415

Lys Cys Gly Lys Xaa Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Xaa Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser

450 455 460

Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro

465 470 475 480

Arg Asp Lys Glu Xaa Tyr Pro Leu Xaa Ser Leu Xaa Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln

500

<210> 479

<211> 506

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

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<223

> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (161)..(161)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (183)..(183)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (188)..(188)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (228)..(228)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (330)..(330)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (337)..(337)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (361)..(361)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (363)..(363)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (484)..(484)

<223> Xaa can be any naturally occurring amino acid

<400> 479

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Xaa Gln Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Val Gln Gln Ala Ala Ala Asp Thr Gly Asn Asn Ser Pro Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Xaa Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Xaa Leu Asn Thr Met Xaa Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Pro Ala

210 215 220

Pro Gly Gln Xaa Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ser Asn Pro Asp Xaa Lys Thr Ile Leu Lys Ala

325 330 335

Xaa Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Xaa Ile Xaa Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Ser Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Pro Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Lys Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Ser Glu Gly His Gln Met Lys Asp Cys Thr Gly Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Pro Thr Ala Pro

450 455 460

Pro Ala Glu Ser Phe Arg Phe Gly Gly Glu Thr Thr Thr Pro Pro Gln

465 470 475 480

Lys Gln Glu Xaa Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys

485 490 495

Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505

<210> 480

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (35)..(35)

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<222> (78)..(78)

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<220><221> misc_feature

<222> (94)..(94)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (112)..(112)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (120)..(120)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (127)..(127)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (164)..(164)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (206)..(206)

<223> Xaa can be any naturally occurring amino acid

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<222> (308)..(308)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (364)..(364)

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<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (453)..(453)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (459)..(459)

<223> Xaa can be any naturally occurring amino acid

<400> 480

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Arg Leu Lys
20 25 30

His Ile Xaa Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Ile Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ser Leu Lys Thr Gly Ser Glu Glu Leu Arg Ser Xaa Phe Asn
65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Asn Ile Glu Xaa Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Xaa
100 105 110

Lys Lys Ala Gln Gln Ala Ala Xaa Asp Thr Gly Asn Ser Ser Xaa Gln
115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val
130 135 140

His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val
145 150 155 160

Glu Glu Lys Xaa Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu
165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Xaa Asn Glu
195 200 205

Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile

210 215 220

Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
225 230 235 240
Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro
245 250 255
Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn
260 265 270
Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln
275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Arg Thr
290 295 300
Leu Arg Ala Xaa Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu
305 310 315 320
Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys
325 330 335
Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln
340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Xaa Ala Glu Ala Met
355 360 365
Ser Leu Val Asn Pro Thr Thr Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Xaa Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Xaa Glu Pro Thr Ala Pro Xaa Glu Pro Thr Ala Pro
450 455 460

Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Ala Pro Ser Gln
465 470 475 480

Lys Gln Glu Pro Ile Asp Lys Glu Lys Tyr Pro Leu Ala Ser Leu Arg
485 490 495
Ser Leu Phe Gly Asn Asp Pro
500

<210> 481
<211> 497
<212> PRT
<213> Human immunodeficiency virus
<400> 481
Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Val Val Trp Ala Ser Arg Glu Leu Glu Lys Phe Ala Ile Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Ser Ala Leu Lys Thr Gly Ser Glu Glu Phe Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Glu Lys Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Arg Asn Pro Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val Pro Ala Gly Pro Val Ala
210 215 220

Pro Gly Gln Ile Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Asn Pro Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Ala Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Pro Arg
370 375 380
Thr Gln Arg Lys Met Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser Ser Arg Gly Arg Pro Gly Asn Phe
435 440 445
Pro Gln Ser Arg Leu Glu Pro Thr Ala Pro Pro Glu Glu Ser Leu Arg
450 455 460
Lys Glu Thr Ala Thr Pro Pro Gln Lys Gln Glu Thr Arg Asp Glu Leu
465 470 475 480

Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser Ser
485 490 495
Gln

<210> 482
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
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<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (40)..(40)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (58)..(58)
<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
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<223> Xaa can be any naturally occurring amino acid
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<222> (118)..(118)
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<220><221> misc_feature

<222> (121)..(121)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (146)..(146)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (148)..(148)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (164)..(164)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (168)..(168)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (185)..(185)

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<220><221> misc_feature

<222> (268)..(268)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (275)..(275)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (278)..(278)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (280)..(280)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (286)..(286)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (295)..(295)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (304)..(304)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (309)..(309)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (326)..(326)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (340)..(340)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (416)..(416)

<223> Xaa can be any naturally occurring amino acid

<400> 482

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Xaa Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Xaa Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Xaa Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Arg Arg Ile Asn Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Xaa Glu Ser Lys
100 105 110
Lys Arg Ala Gln Gln Xaa Glu Ala Xaa Thr Lys Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Xaa Ile Xaa Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Xaa Ser Pro Glu Xaa Ile Pro Met Phe Thr Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Xaa Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Xaa Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Xaa Gly Leu Asn Lys
260 265 270
Ile Val Xaa Met Tyr Xaa Pro Xaa Ser Ile Leu Asp Ile Xaa Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Xaa Tyr Val Asp Arg Phe Tyr Lys Thr Xaa
290 295 300
Arg Ala Glu Gln Xaa Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Xaa Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Xaa Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Leu Met Gln Arg Gly Asn Ile Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Xaa

405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Glu Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ala Gln Lys Gln Glu Thr Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 483

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<220

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<222> (24)..(24)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (230)..(230)

<223> Xaa can be any naturally occurring amino acid

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<222> (316)..(316)

<223> Xaa can be any naturally occurring amino acid

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<222> (339)..(339)

<223> Xaa can be any naturally occurring amino acid

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<222> (435)..(435)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (478)..(478)

<223> Xaa can be any naturally occurring amino acid

<400> 483

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Xaa Gly Lys Lys Gln Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Lys Ile Leu Ile Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Thr Ala Ala Ala Asp Pro Gly Asn Ser Ser Gln
115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val
130 135 140

```
His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val
145                 150                 155                 160
Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu
                165                 170                 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
            180                 185                 190
Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu
        195                 200                 205
Glu Ala Ala Glu Trp Asp Arg Met His Pro Val His Ala Gly Pro Ile
    210                 215                 220
Ala Pro Gly Gln Met Xaa Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
225                 230                 235                 240

Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro
                245                 250                 255
Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn
            260                 265                 270
Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln
        275                 280                 285
Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Val
    290                 295                 300

Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Xaa Trp Met Thr Glu
305                 310                 315                 320
Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys
                325                 330                 335
Ala Leu Xaa Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln
            340                 345                 350
Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met
        355                 360                 365

Ser Lys Val Thr Ser Ser Asn Thr Ile Met Ile Gln Gly Gly Asn Phe
    370                 375                 380
Lys Asn Gln Arg Lys Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His
```

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Xaa Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Asn Arg Thr Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Met

450 455 460

Phe Gly Glu Glu Thr Thr Pro Ser Gln Arg Gln Glu Ser Xaa Asp Lys

465 470 475 480

Glu Met Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro

485 490 495

Ser Ser Gln

<210> 484

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (15)..(15)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (25)..(25)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (49)..(49)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (73)..(73)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (105)..(105)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (450)..(450)

<223> Xaa can be any naturally occurring amino acid

<400> 484

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Xaa Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Xaa Lys Lys Gln Tyr Arg Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Xaa Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Ile Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Xaa Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Val Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Xaa Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Ala Asn Thr Gly Ser Ser
115 120 125

Ser Thr Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Ala
130 135 140

Met Val His Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160

Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser
165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly
210 215 220
Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala

225 230 235 240
Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn
245 250 255
Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly
260 265 270
Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile
275 280 285
Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr

290 295 300
Lys Thr Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met
305 310 315 320
Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile
325 330 335
Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350
Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu

355 360 365
Ala Met Ser Gln Met Thr Asn Pro Gly Thr Ile Met Met Gln Arg Gly
370 375 380
Asn Phe Arg Asn Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys
385 390 395 400
Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys
405 410 415
Trp Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg

420 425 430
Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro
435 440 445
Gly Xaa Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu

450 455 460

Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu

465 470 475 480

Pro Ile Asp Lys Glu Met Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe

485 490 495

Gly Asn Asp Pro Ser Ser Gln

500

<210> 485

<211> 504

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (197)..(197)

<223> Xaa can be any naturally occurring amino acid

<400> 485

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

His Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Asn Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Val Gln Gln Ala Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser

115 120 125

Ser Asn Gln Val Ser Gln Asn Tyr Pro Ile Val Arg Asn Ile Gln Gly

130 135 140

Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val

145 150 155 160

Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe

165 170 175

Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu

180 185 190

Asn Thr Val Gly Xaa His Gln Ala Ala Met Gln Met Leu Lys Glu Thr

195 200 205

Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Met His Pro Val His Ala

210 215 220

Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile

225 230 235 240

Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Asp Trp Met Thr His

245 250 255

Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu

260 265 270

Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp

275 280 285

Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe

290 295 300

Tyr Lys Thr Leu Arg Ala Glu Gln Ala Thr Gln Asp Val Lys Asn Trp

305 310 315 320

Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr

325 330 335

Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr

340 345 350

Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala

355 360 365

Glu Ala Met Ser Gln Val Thr Gly Ser Ala Thr Ile Met Met Gln Lys

370 375 380

Gly Asn Phe Lys Asn Gln Arg Arg Ile Val Lys Cys Phe Asn Cys Gly
385 390 395 400
Arg Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly

405 410 415
Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu
420 425 430
Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg
435 440 445
Pro Gly Asn Phe Leu Gln Asn Arg Pro Glu Pro Ser Ala Pro Pro Glu
450 455 460
Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln

465 470 475 480
Glu Pro Ile Asp Lys Glu Thr Tyr Pro Leu Ala Ser Leu Lys Ser Leu
485 490 495
Phe Gly Asn Asp Leu Leu Ser Gln
500

<210> 486
<211> 508
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (34)..(34)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (147)..(147)
<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
<222> (237)..(237)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (384)..(384)
<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (413)..(413)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (436)..(436)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (460)..(460)

<223> Xaa can be any naturally occurring amino acid

<400> 486

Met Gly Ala Arg Ala Ser Ile Leu Thr Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Xaa Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser
115 120 125

Ser Lys Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln
130 135 140

Met Val Xaa Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160

Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser
165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205

Asn Glu Glu Ala Ala Asp Trp Asp Arg Leu His Pro Val His Ala Gly
210 215 220

Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Xaa Asp Ile Ala
225 230 235 240

Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn
245 250 255

Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly
260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile
275 280 285

Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300

Lys Val Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met
305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile
325 330 335

Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350

Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu
355 360 365

Ala Met Ser Gln Val Thr Asn Ala Ser Ala Ala Ile Met Met Gln Xaa
370 375 380

Gly Asn Phe Arg Thr Pro Gly Lys Thr Val Lys Cys Phe Asn Cys Gly
385 390 395 400

Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Xaa Lys Arg Gly
405 410 415

Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu

420 425 430

Arg Gln Ala Xaa Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg

435 440 445

Pro Gly Asn Phe His Gln Ser Arg Leu Glu Pro Xaa Ala Pro Pro Glu

450 455 460

Glu Ser Phe Arg Phe Lys Glu Glu Ile Thr Pro Pro Ser Gln Lys Gln

465 470 475 480

Glu Pro Ile Asp Lys Glu Ile Asp Lys Glu Thr Tyr Pro Leu Ala Ser

485 490 495

Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505

<210> 487

<

211> 498

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (451)..(451)

<223> Xaa can be any naturally occurring amino acid

<400> 487

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Lys Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Ile Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Phe Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Thr Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Leu Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Ser Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro Pro Ile
245 250 255
Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr His Pro Ala Ile Met Met Gln Arg Gly Asn Phe Lys Asn
370 375 380
Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile
385 390 395 400
Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly
405 410 415
Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe
420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Pro
435 440 445
Gln Ser Xaa Leu Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe
450 455 460
Gly Glu Glu Thr Ala Pro Phe Gln Lys Gln Glu Arg Val Asp Arg Glu
465 470 475 480
Leu Pro Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Ser
485 490 495

Ser Gln

<210> 488
<211> 504
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (14)..(14)
<223> Xaa can be any naturally occurring amino acid
<400> 488
Met Gly Ala Arg Ala Ser Val Leu Ser Ala Gly Glu Leu Xaa Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Arg Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Val Lys

100 105 110

Glu Lys Ala Lys Gln Ala Thr Thr Asp Thr Arg Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Ile Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Asp Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Gly Ala Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Gly Arg Pro Glu Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu

450 455 460

Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln

465 470 475 480

Glu Thr Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu

485 490 495

Phe Gly Asn Asp Pro Ser Ser Gln

500

<210> 489

<211> 497

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (109)..(109)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (132)..(132)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (139)..(139)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (376)..(376)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (379)..(379)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (383)..(383)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (402)..(402)

<223> Xaa can be any naturally occurring amino acid

<400> 489

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Arg Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Xaa Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Ala Asp Thr Gly Asn Ser Lys Gln
115 120 125
Val Ser Gln Xaa Tyr Pro Ile Val Gln Asn Xaa Gln Gly Gln Met Val
130 135 140

His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val
145 150 155 160
Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu
165 170 175
Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190
Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu
195 200 205

Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile
210 215 220
Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
225 230 235 240
Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro
245 250 255
Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn
260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln
275 280 285
Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr
290 295 300
Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu
305 310 315 320

Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys
325 330 335

Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln
340 345 350
Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met
355 360 365
Ser Gln Val Thr Asn Ser Asn Xaa Ile Met Xaa Gln Arg Gly Xaa Phe
370 375 380
Arg Asn Gln Arg Lys Ile Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly
385 390 395 400

His Xaa Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys
405 410 415
Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala
420 425 430
Asn Phe Leu Gly Lys Val Trp Pro Ser His Lys Gly Arg Pro Gly Asn
435 440 445
Phe Leu Gln Asn Arg Pro Glu Pro Ser Ala Pro Pro Ala Glu Ser Phe
450 455 460

Arg Phe Gly Glu Glu Thr Thr Pro Pro Gln Lys Gln Glu Gln Thr Asp
465 470 475 480
Lys Glu Pro Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Ser Asp
485 490 495
Pro

<210> 490
<211> 486
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (122)..(122)
<223> Xaa can be any naturally occurring amino acid
<400> 490

Met Gly Ala Arg Ala Ser Val Leu Ser Ala Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Ile Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Thr Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Arg Ala Ala Gln Gln Ala Ala Thr Gly Xaa Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Pro Ile Ala Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Pro Gln Ala Gly Pro Leu Pro

210 215 220

Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Thr Trp Met Thr Gly Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Val Met Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Ala Asn Pro Ala Thr Val Met Met Gln Arg Gly Asn Tyr Lys

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Asn Phe Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro

435 440 445

Glu Glu Ser Phe Ser Phe Gly Gly Glu Ile Thr Thr Pro Pro Gln Lys

450 455 460

Gln Glu Leu Thr Asp Lys Glu Leu Tyr Pro Ser Ala Ser Leu Lys Ser

465 470 475 480

Leu Phe Gly Asn Asp His

485

<210> 491

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (349)..(349)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (417)..(417)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (486)..(486)

<223> Xaa can be any naturally occurring amino acid

<400> 491

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Lys Gln Ile Leu Gly Gln Leu
50 55 60

His Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val Leu Gln Gly Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Ala Gln Gln Ala Ala Ala Asp Ala Gly Asn Ser Ser Gln Val Ser
115 120 125

Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln
130 135 140

Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu
145 150 155 160
Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu
165 170 175

Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly
180 185 190
His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala
195 200 205
Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala Pro
210 215 220
Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser
225 230 235 240

Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro
245 250 255
Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys Ile
260 265 270
Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly Pro
275 280 285
Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg
290 295 300

Ala Glu Gln Ala Ser Gln Glu Val Lys Gly Trp Met Thr Glu Thr Leu
305 310 315 320
Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu
325 330 335
Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Xaa Gln Gly Val
340 345 350
Gly Gly Pro Ser His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser Gln
355 360 365

Val Thr Asn Gln Asn Ala Ile Met Met Gln Arg Gly Asn Phe Lys Asn
370 375 380
Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile

385 390 395 400

Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys Gly

405 410 415

Xaa Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Met Glu Ser Phe Arg Glu

450 455 460

Glu Thr Thr Ala Pro Ser Gln Lys Gln Glu Thr Ile Asp Arg Asp Arg

465 470 475 480

Asp Lys Glu Leu Tyr Xaa Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn

485 490 495

Asp Pro Ser Ser Gln

500

<210> 492

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (30)..(30)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (276)..(276)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (376)..(376)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (403)..(403)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (486)..(486)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (488)..(488)

<223> Xaa can be any naturally occurring amino acid

<400> 492

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Xaa Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ser Leu Lys Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Gly Ile Asp Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Glu Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gly Gln
115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val
130 135 140

His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile
145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu
165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu
195 200 205

Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile

210 215 220

Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr

225 230 235 240

Thr Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro

245 250 255

Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn

260 265 270

Lys Ile Val Xaa Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln

275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys

325 330 335

Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Ser His Met Thr Asn Pro Ala Xaa Ile Met Met Gln Arg Gly Asn Phe

370 375 380

Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Xaa Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Ala Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Ser Ser His Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe

450 455 460

Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Gly Pro Ile

465 470 475 480

Tyr Lys Glu Leu Tyr Xaa Leu Xaa Ser Leu Arg Ser Leu Phe Gly Asn

485 490 495

Asp Pro Ser Ser Gln

500

<210> 493

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (303)..(303)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (374)..(374)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (501)..(501)

<223> Xaa can be any naturally occurring amino acid

<400> 493

Met Gly Ala Arg Ala Ser Val Leu Ser Ala Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Val Asp Lys Val Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Gly Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Xaa Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Ser Ser Xaa Ile Met Met Met Gln Lys Gly Asn Phe Arg
370 375 380

Asn Gln Lys Arg Ala Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Arg Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Asn Glu Arg Gln Ala
420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn
435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe
450 455 460

Arg Phe Gly Glu Glu Ala Thr Ala Pro Ser Gln Lys Gln Glu Gln Thr
465 470 475 480

Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn
485 490 495

Asp Pro Leu Ser Xaa
500

<210> 494

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (40)..(40)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (78)..(78)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (82)..(82)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (116)..(116)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (162)..(162)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (175)..(175)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (315)..(315)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (443)..(443)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (462)..(462)

<223> Xaa can be any naturally occurring amino acid

<400> 494

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Xaa Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Ser Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Xaa Phe Asn
65 70 75 80

Thr Xaa Ala Thr Leu Tyr Cys Val His Gln Asn Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Xaa Gln Ala Ala Ala Asp Thr Gly Asn Ser Asn Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Pro Ile Ala Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Xaa Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Xaa Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Ala Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Ile Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Xaa Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
His Val Ser Asn Pro Thr Thr Ile Met Met Gln Lys Gly Asn Phe Lys
370 375 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser Arg Arg Xaa Arg Pro Gly Asn Phe
435 440 445
Leu Gln Asn Arg Leu Glu Pro Thr Ala Pro Pro Glu Glu Xaa Leu Arg
450 455 460

Phe Gly Glu Glu Thr Thr Ala Pro Ser Gln Lys Gln Glu Lys Ala Asp
465 470 475 480
Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln
500

<210> 495
<211> 498
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (458)..(458)
<223> Xaa can be any naturally occurring amino acid
<400> 495

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Gly Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Lys Tyr Lys Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Ile Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Ser Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Lys Lys

100 105 110

Ala Gln Gln Ala Ala Ala Asp Thr Gly Ser Asn Lys Gln Val Ser Gln

115 120 125

Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His Gln Pro

130 135 140

Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys

145 150 155 160

Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu Gly

165 170 175

Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His

180 185 190

Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala

195 200 205

Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala Pro Gly

210 215 220

Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr

225 230 235 240

Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro Val

245 250 255

Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val

260 265 270

Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys

275 280 285

Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala

290 295 300

Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu

305 310 315 320

Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly

325 330 335

Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly

340 345 350

Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Val

355 360 365

Thr Asn Ser Asn Ala Val Met Met Gln Arg Gly Asn Phe Arg Asn Gln

370 375 380

Arg Lys Val Ile Lys Cys Phe Asn Cys Gly Arg Glu Gly His Ile Ala

385 390 395 400

Lys His Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Lys

405 410 415

Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe Leu

420 425 430

Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn Phe Leu Gln

435 440 445

Ser Arg Pro Glu Pro Thr Ala Pro Pro Xaa Glu Ser Phe Ser Phe Arg

450 455 460

Glu Glu Lys Thr Thr Pro Pro Gln Lys Gln Glu Gln Ile Asp Lys Glu

465 470 475 480

Leu Tyr Pro Leu Ser Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser

485 490 495

Ser Gln

<210> 496

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 496

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Lys Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Lys Gln Ile Leu Ala Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Met
100 105 110

Lys Lys Ala Gln Gln Thr Ala Ala Gly Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Ala Thr Asn Ser Ala Asn Ile Ile Met Met Gln Arg Gly Asn Phe
370 375 380
Arg Asn Gln Arg Lys Ile Ile Lys Cys Phe Asn Cys Gly Arg Glu Gly
385 390 395 400

His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys
405 410 415
Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala
420 425 430
Asn Phe Leu Gly Lys Ile Trp Pro Ser Asn Lys Gly Arg Pro Gly Asn
435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe
450 455 460

Arg Phe Gly Glu Glu Thr Thr Ala Ser Pro Gln Lys Gln Glu Pro Ile
465 470 475 480
Asn Lys Glu Leu Tyr Pro Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly
485 490 495
Asn Asp Pro Ser Ser Gln
500

<210> 497
<211> 501
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (14)..(14)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature

<222> (26)..(26)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (385)..(385)
<223> Xaa can be any naturally occurring amino acid
<400> 497
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Xaa Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Xaa Lys Arg Tyr Arg Leu Lys
20 25 30
His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Glu Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Gly Ile Gly Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110
Lys Lys Ala Gln Gln Val Ala Ala Ala Ala Gly Ala Gly Asn Ser Ser
115 120 125
Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140
Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160
Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala

165 170 175
Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
180 185 190
Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205
Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro
210 215 220
Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240
Thr Thr Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro
245 250 255
Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu
260 265 270
Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg
275 280 285
Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300
Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr
305 310 315 320
Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Ala Asn Ser Thr Thr Ile Met Met Gln Lys Gly Asn Phe

370 375 380

Xaa Asn Gln Arg Lys Met Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe

450 455 460

Arg Phe Gly Gly Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile

465 470 475 480

Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn

485 490 495

Asp Pro Ser Ser Gln

500

<210> 498

<211> 506

<212> PRT

<213> Human immunodeficiency virus

<400> 498

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Gly Gly Cys Arg Gln Ile Ile Ala Gln Leu

50 55 60

His Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Glu

115 120 125

Asn Ser Ser Gln Ile Ser Gln Asn Tyr Pro Ile Ile Gln Asn Leu Gln

130 135 140

Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp

145 150 155 160

Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met

165 170 175

Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met

180 185 190

Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu

195 200 205

Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His

210 215 220

Ala Gly Pro Ala Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp

225 230 235 240

Ile Ala Gly Ser Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr

245 250 255

Ser Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile

260 265 270

Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu

275 280 285

Asp Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg

290 295 300

Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn

305 310 315 320

Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys

325 330 335

Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met

340 345 350

Thr Ala Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Lys Val Leu

355 360 365

Ala Glu Ala Met Ser Gln Thr Thr Ser Ser Ala Ala Ile Met Met Gln

370 375 380

Lys Gly Asn Leu Arg Asn Pro Lys Lys Pro Val Lys Cys Phe Asn Cys

385 390 395 400

Gly Lys Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys

405 410 415

Gly Cys Trp Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr

420 425 430

Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly

435 440 445

Arg Pro Gly Asn Phe Phe Gln Ser Gly Leu Glu Pro Thr Ala Pro Pro

450 455 460

Glu Glu Ser Phe Arg Phe Gly Glu Ala Thr Ala Thr Pro Pro Gln Lys

465 470 475 480

Gln Glu Pro Ile Asp Lys Glu Pro Leu Tyr Pro Leu Thr Ser Leu Lys

485 490 495

Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505

<210> 499

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (82)..(82)

<223> Xaa can be any naturally occurring amino acid

<400> 499

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Arg Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Xaa Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Ala Gln Gln Ala Ala Ala Gly Ala Gly Asn Asn Ser
115 120 125

Pro Ala Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met
130 135 140

Val His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala
165 170 175

Leu Ala Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro

210 215 220

Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Gly Asn Pro

245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Ala Thr Ser Ser Ala Ala Ala Ile Met Met Gln Arg Gly

370 375 380

Asn Phe Arg Asn Gln Arg Lys Ser Ile Lys Cys Phe Asn Cys Gly Arg

385 390 395 400

Glu Gly His Leu Ala Arg Asn Cys Lys Ala Pro Arg Lys Lys Gly Cys

405 410 415

Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg

420 425 430

Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro

435 440 445

Gly Asn Phe Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu

450 455 460

Ser Phe Lys Phe Gly Glu Glu Thr Ala Thr Pro Pro Gln Lys Gln Glu

465 470 475 480

Pro Ile Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe

485 490 495

Gly Ser Asp Pro Ser Ser Gln

500

<210> 500

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 500

Met Gly Ala Arg Ala Ser Ile Leu Ser Ser Gly Gln Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Lys Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Leu Lys Ile Asp Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser Asn

115 120 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met

130 135 140

Val His Gln Asn Met Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala

165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn

195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro

210 215 220

Val Ala Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro

245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Ala Ala Ser Leu Glu Glu Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Val Thr Thr Pro Ser Ala Ile Met Met Gln Arg Gly Asn

370 375 380

Phe Arg Asn Gln Arg Lys Ser Val Lys Cys Phe Asn Cys Gly Lys Glu

385 390 395 400

Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser

450 455 460

Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro

465 470 475 480

Ile Asp Lys Glu Ile Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln

500

<210> 501

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 501

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Ser Lys Lys Arg Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Lys Gln Ile Leu Ala Gln Leu

50 55 60

His Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Thr Ala Ile Asp Ala Gly Ser Ser Ser Gln Ala
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala

210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Ala Trp Ile Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Thr Ser Ala Asn Ile Met Met Gln Arg Gly Asn Phe Lys

370 375 380

Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Gln Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Val Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asn

465 470 475 480

Lys Glu Gln Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 502

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<400> 502

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Val Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Ser Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Val Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Ile Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Asn
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Ser His
115 120 125
Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val
130 135 140
His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val

145 150 155 160
Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu
165 170 175
Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190
Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu
195 200 205
Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile

210 215 220
Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
225 230 235 240
Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro
245 250 255
Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn
260 265 270
Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln

275 280 285
Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys

325 330 335

Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Ser Gln Val Thr Asn Pro Ala Asn Ile Met Met Gln Arg Gly Asn Phe

370 375 380

Arg Asn Pro Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Pro Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe

450 455 460

Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Gln Ile

465 470 475 480

Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn

485 490 495

Asp Pro Ser Ser Gln

500

<210> 503

<211> 504

<212> PRT

<213> Human immunodeficiency virus

<400> 503

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Gln Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Ile Lys Ser Leu Tyr Asn
65 70 75 80
Met Ile Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Ala Gly Glu Asn Ser Lys Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Ile Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Asp Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Met Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Lys

370 375 380

Lys Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Asn Arg Pro Glu Pro Val Glu Pro Thr Ala Pro Pro Glu Glu

450 455 460

Ser Phe Arg Phe Gly Glu Glu Ala Thr Thr Pro Pro Pro Gln Lys Gln

465 470 475 480

Asp Thr Lys Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu

485 490 495

Phe Gly Asn Asp Pro Ser Ser Gln

500

<210> 504

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (303)..(303)

<223> Xaa can be any naturally occurring amino acid

<400> 504

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Pro Ala Ala Ala Asp Thr Gly Ser Asn Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu Ser

165 170 175

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Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
            180                 185                 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

        195                 200                 205
Ala Ala Glu Trp Asp Arg Met His Pro Val His Ala Gly Pro Ile Ala
    210                 215                 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225                 230                 235                 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile
                245                 250                 255
Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Met Gly Leu Asn Lys

            260                 265                 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
        275                 280                 285
Pro Lys Glu Ser Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Xaa Leu
    290                 295                 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305                 310                 315                 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

                325                 330                 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
            340                 345                 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
        355                 360                 365
Gln Val Thr Asn Ser Ala Thr Val Met Met Gln Arg Gly Asn Tyr Arg
    370                 375                 380
Asn Gln Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385                 390                 395                 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
                405                 410                 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
```

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Pro Ile Pro Ser Gln Lys Gln Glu Pro Thr Asp

465 470 475 480

Lys Glu Thr Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 505

<211> 492

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (15)..(15)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (226)..(226)

<223> Xaa can be any naturally occurring amino acid

<400> 505

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Xaa Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Thr His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Xaa Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Ser Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Asp Lys Glu Leu Tyr Pro Leu Ala Ser

465 470 475 480

Leu Lys Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln

485 490

<210> 506

<

211> 503

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (92)..(92)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (101)..(101)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (146)..(146)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (244)..(244)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (343)..(343)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (463)..(463)

<223> Xaa can be any naturally occurring amino acid

<400> 506

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Asn Xaa Glu Val Arg Asp
85 90 95

Thr Lys Glu Ala Xaa Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Gly Ala Gly Asn Ser Ser
115 120 125

Gln Ala Ala Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln
130 135 140

Met Xaa His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160

Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser
165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190
Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205
Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly
210 215 220
Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240

Gly Thr Thr Xaa Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn
245 250 255
Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly
260 265 270
Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Ile Ser Ile Leu Asp Ile
275 280 285
Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met
305 310 315 320
Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile
325 330 335
Leu Lys Ala Leu Gly Pro Xaa Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350
Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu
355 360 365

Ala Met Ser Gln Val Thr Thr Ser Asn Thr Ile Met Met Gln Arg Gly
370 375 380
Asn Phe Arg Asn Gln Arg Lys Ala Val Lys Cys Phe Asn Cys Gly Lys
385 390 395 400
Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys

405 410 415

Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg

420 425 430

Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro

435 440 445

Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Xaa Glu

450 455 460

Ser Phe Arg Phe Gly Glu Glu Ala Thr Thr Pro Pro Gln Lys Pro Glu

465 470 475 480

Pro Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe

485 490 495

Gly Asn Asp Pro Ser Ser Gln

500

<210> 507

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (200)..(200)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (392)..(392)

<223> Xaa can be any naturally occurring amino acid

<400> 507

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Ala Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Ile Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Leu Arg Ile Asp Val Lys Asp

85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Val Thr Ala Ala Asp Thr Gly Asn Ser Ser Lys Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Xaa Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Ile Val Lys Xaa Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Ile Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Asn Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Lys Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Ser Lys Glu

465 470 475 480

Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro

485 490 495

Ser Ser Gln

<210> 508

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (17)..(17)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (20)..(20)

<223> Xaa can be any naturally occurring amino acid

<220

><221> misc_feature

<222> (23)..(23)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (30)..(30)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (49)..(49)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (51)..(51)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (57)..(57)

<223> Xaa can be any naturally occurring amino acid

<220><221

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<222> (154)..(154)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (403)..(403)

<223> Xaa can be any naturally occurring amino acid

<400> 508

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Xaa Lys Ile Xaa Leu Arg Xaa Gly Gly Lys Lys Lys Tyr Xaa Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Xaa Leu Xaa Glu Thr Ser Glu Gly Xaa Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Gln

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Arg Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Xaa Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365
Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Lys
370 375 380
Gly Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Xaa Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Arg Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Glu Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Ser Ile Asp
465 470 475 480
Lys Asp Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495
His Ser Ser Gln
500

<210> 509
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (17)..(17)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (28)..(28)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (37)..(37)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (99)..(99)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (118)..(118)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (162)..(162)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (187)..(187)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (312)..(312)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (362)..(362)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (400)..(400)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (419)..(419)

<223> Xaa can be any naturally occurring amino acid

<400> 509

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Xaa Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Xaa Tyr Arg Leu Lys

20 25 30

His Leu Val Trp Xaa Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Thr Gly Cys Arg Gln Ile Leu Gln Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Val Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Xaa Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Glu Gln Gln Xaa Ala Ala Gly Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Xaa Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Xaa Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Xaa Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Xaa Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Ser Pro Ala Thr Val Met Ile Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ala Val Lys Cys Phe Asn Cys Gly Lys Glu Gly Xaa
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Xaa Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Thr Ile Asp
465 470 475 480

Arg Asp Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln

500

<210> 510

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (10)..(10)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (48)..(48)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (84)..(84)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (113)..(113)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (127)..(127)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (135)..(135)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (201)..(201)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (203)..(203)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (215)..(215)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (240)..(240)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (290)..(290)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (292)..(292)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (309)..(309)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (344)..(344)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (362)..(362)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (394)..(394)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (425)..(425)

<223> Xaa can be any naturally occurring amino acid

<400> 510

Met Gly Ala Arg Ala Ser Val Leu Ser Xaa Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Tyr Ala Leu Asn Xaa
35 40 45

Gly Leu Leu Glu Thr Thr Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Ala Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Xaa Leu Tyr Cys Val His Gln Arg Ile Glu Ile Arg Asp
85 90 95
Thr Lys Glu Ala Leu Asp Arg Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Xaa Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Xaa Val
115 120 125
Ser Gln Asn Tyr Pro Ile Xaa Gln Asn Met Gln Gly Gln Met Val His
130 135 140

Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Xaa Lys Xaa Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Xaa His Pro Val Gln Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Xaa
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Xaa Glu Xaa Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Xaa Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Gly Ala Thr Leu Xaa Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ser His Lys Ala Arg Xaa Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Pro Thr Thr Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ser Val Lys Cys Phe Xaa Cys Gly Lys Glu Gly His
385 390 395 400

Thr Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Xaa Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Gly Arg Pro Gly Asn
435 440 445
Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe
450 455 460

Arg Phe Gly Glu Glu Thr Thr Ala Pro Leu Gln Lys Gln Glu Lys Gly
465 470 475 480
Asp Gly Glu Leu Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Asn
485 490 495
Asp Pro Ser Ser Gln
500

<210> 511
<211> 505
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (385)..(385)
<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (393)..(393)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (452)..(452)

<223> Xaa can be any naturally occurring amino acid

<400> 511

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Ser Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Ile Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Ile Gln Ile
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Asp Asn Thr Gly Ser Asn Asn Thr Gly
115 120 125

Ser Asn Asn Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln
130 135 140

Gly Gln Met Val His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp
145 150 155 160

Val Lys Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met
165 170 175

Phe Thr Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met
180 185 190

Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu
195 200 205
Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His
210 215 220
Ala Gly Pro Pro Val Ala Gly Gln Met Arg Glu Pro Arg Gly Ser Asp

225 230 235 240
Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr
245 250 255
Ser Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile
260 265 270
Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu
275 280 285
Asp Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg

290 295 300
Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn
305 310 315 320
Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys
325 330 335
Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met
340 345 350
Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu

355 360 365
Ala Glu Ala Met Ser Gln Leu Thr Gly Ser Ala Thr Val Met Met Gln
370 375 380
Xaa Gly Asn Phe Arg Asn Gln Arg Xaa Ser Val Lys Cys Phe Asn Cys
385 390 395 400
Gly Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg
405 410 415
Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Ile

420 425 430
Glu Gly Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly

435 440 445

Arg Pro Gly Xaa Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro

450 455 460

Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Lys Gln

465 470 475 480

Glu Lys Arg Asp Gln Glu Leu Tyr Pro Pro Leu Thr Ser Leu Arg Ser

485 490 495

Leu Phe Gly Asn Asp Pro Leu Ser Gln

500 505

<210> 512

<211> 505

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (487)..(487)

<223> Xaa can be any naturally occurring amino acid

<400> 512

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Gln Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Asp Thr Gly Asn Ala Asn Gln

115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val

130 135 140

His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val

145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu

165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val

180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu

195 200 205

Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile

210 215 220

Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr

225 230 235 240

Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro

245 250 255

Ile Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln

275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Arg Thr Ile Leu Lys

325 330 335

Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Ser Gln Val Thr Ser Pro Ala Ala Val Met Met Gln Arg Gly Asn Phe
370 375 380
Arg Asn Gln Arg Lys Ser Val Lys Cys Phe Asn Cys Gly Lys Glu Gly
385 390 395 400
His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415
Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala
420 425 430
Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Gly Arg Pro Gly
435 440 445
Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro
450 455 460
Glu Glu Ser Phe Arg Phe Gly Glu Glu Ile Thr Thr Pro Ser Gln Lys

465 470 475 480
Gln Glu Thr Lys Asp Lys Xaa Met Tyr Pro Leu Thr Ser Leu Arg Ser
485 490 495
Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 513
<211> 504
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (384)..(384)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (483)..(483)
<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
<222> (501)..(501)
<223> Xaa can be any naturally occurring amino acid
<400> 513

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Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1               5                  10                  15
Glu Lys Ile Arg Leu Arg Pro Met Gly Lys Lys Lys Tyr Arg Leu Lys
            20                  25                  30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
        35                  40                  45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Glu Gln Leu
    50                  55                  60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65                  70                  75                  80
Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
                85                  90                  95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
            100                 105                 110

Lys Lys Thr Gln Gln Ala Ala Ala Asp Ala Gly Lys Ser Ser Gln Val
        115                 120                 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
    130                 135                 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145                 150                 155                 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ala
                165                 170                 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
            180                 185                 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
        195                 200                 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
    210                 215                 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225                 230                 235                 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
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245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Pro Ala Thr Ile Met Met Gln Arg Gly Asn Phe Xaa

370 375 380

Asn Gln Arg Lys Pro Ile Lys Cys Phe Asn Cys Gly Lys Asp Gly His

385 390 395 400

Ile Ala Ser Lys Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Gln Glu Gly His Gln Met Arg Asp Cys Pro Gly Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Leu Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Asn Pro Pro Gln Lys Gln

465 470 475 480

Glu Ser Xaa Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu

485 490 495

Phe Gly Asn Asp Xaa Leu Ser Gln
500

<210> 514

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 514

Met Gly Ala Arg Ala Ser Val Leu Arg Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Gly Gln Phe
50 55 60

Gln Ser Ser Leu Gln Thr Gly Ser Glu Glu Phe Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Arg Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Asn Gln Val
115 120 125

Ser Gln Asn Ser Asn Gln Ala Ser Gln Asn Tyr Pro Ile Val Gln Asn
130 135 140

Leu Gln Gly Gln Met Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn
145 150 155 160

Ala Trp Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile
165 170 175

Pro Met Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Thr Asp Leu Asn
180 185 190

Thr Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu

195 200 205

Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro

210 215 220

Val His Ala Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly

225 230 235 240

Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp

245 250 255

Met Thr Asn Asn Pro Pro Ile Pro Val Gly Asp Ile Tyr Lys Arg Trp

260 265 270

Ile Ile Met Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser

275 280 285

Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val

290 295 300

Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val

305 310 315 320

Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp

325 330 335

Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu

340 345 350

Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg

355 360 365

Val Leu Ala Glu Ala Met Ser Gln Val Thr Asn Ser Thr Ala Ile Met

370 375 380

Met Gln Arg Gly Asn Leu Arg Asn Gln Arg Lys Thr Ile Lys Cys Phe

385 390 395 400

Asn Cys Gly Lys Glu Gly His Leu Ala Arg Asn Cys Arg Ala Pro Arg

405 410 415

Lys Lys Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp

420 425 430

Cys Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Asn

435 440 445

Lys Gly Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala
450 455 460
Pro Pro Glu Glu Ser Phe Arg Glu Glu Met Ala Thr Pro Ser Gln Lys
465 470 475 480
Gln Glu Thr Arg Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser
485 490 495

Leu Phe Gly Asn Asp Pro
500

<210> 515
<211> 501
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (39)..(39)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (175)..(175)
<223> Xaa can be any naturally occurring amino acid
<400> 515
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys His Tyr Gln Leu Lys

20 25 30
His Ile Val Trp Ala Ser Xaa Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Phe Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95
Thr Gln Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Asp Thr Gly Lys Ser Ser Gln

115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val

130 135 140

His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val

145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Xaa Leu

165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val

180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu

195 200 205

Glu Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Val

210 215 220

Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr

225 230 235 240

Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro

245 250 255

Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln

275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys

325 330 335

Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Ser Gln Leu Thr Asn Ser Ala Thr Val Met Met Gln Arg Gly Asn Phe

370 375 380

Arg Asn Gln Arg Gln Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Ile Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro Glu

450 455 460

Glu Ser Phe Arg Phe Gly Glu Glu Thr Ala Thr Pro Ser Pro Lys Gln

465 470 475 480

Glu Pro Ile Asp Lys Glu Leu Tyr Pro Ser Ala Ser Leu Arg Ser Leu

485 490 495

Phe Gly Asn Asp Leu

500

<210> 516

<211> 512

<212> PRT

<213> Human immunodeficiency virus

<400> 516

Met Gly Ala Arg Ala Ser Val Leu Ser Ala Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Ile Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Gly Ala Gly Asn Ser Ser Gln Val

115 120 125

Ser Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met

130 135 140

Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala

165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn

195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro

210 215 220

Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Val Gly Trp Met Thr Ser Asn Pro

245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr
305 310 315 320
Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335
Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350
Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Ile Leu Ala Glu Ala
355 360 365
Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn
370 375 380
Phe Arg Asn Gln Arg Arg Thr Val Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400
Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Gly Gly Cys Trp

405 410 415
Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Ser Glu Arg
420 425 430
Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Asn Lys Gly Arg Pro
435 440 445
Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Ala Gln Ser Arg Leu Glu
450 455 460
Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr

465 470 475 480
Thr Pro Ser Gln Lys Gln Glu Ser Lys Asp Arg Asp Lys Glu Leu Tyr
485 490 495
Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505 510

<210> 517
<211> 498
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (203)..(203)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
<222> (378)..(378)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (396)..(396)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (430)..(430)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (440)..(440)
<223> Xaa can be any naturally occurring amino acid
<400> 517

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Ser Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Thr Gln Gln Ala Ala Ala Asp Ala Gly Ser Gln Val Ser Gln
115 120 125
Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln Pro

130 135 140

Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys
145 150 155 160
Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser Glu Gly
165 170 175
Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His
180 185 190
Gln Ala Ala Met Gln Met Leu Lys Glu Ala Xaa Asn Glu Glu Ala Ala
195 200 205

Asp Trp Asp Arg Thr His Pro Val His Ala Gly Pro Val Ala Pro Gly
210 215 220
Gln Leu Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr
225 230 235 240
Leu Gln Glu Gln Ile Gln Trp Met Thr Asn Asn Pro Pro Ile Pro Val
245 250 255
Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val
260 265 270

Arg Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile Lys Gln Gly Pro Lys
275 280 285
Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala
290 295 300
Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr Leu Leu
305 310 315 320
Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Arg Ala Leu Gly
325 330 335

Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly
340 345 350
Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Val
355 360 365
Gln Gly Pro Pro Ala Ile Met Met Gln Xaa Gly Asn Phe Arg Asn Gln
370 375 380

Gly Arg Ile Ile Lys Cys Phe Asn Cys Gly Lys Xaa Gly His Ile Ala
385 390 395 400

Lys Asn Cys Arg Ala Pro Arg Arg Arg Gly Cys Trp Lys Cys Gly Lys
405 410 415
Glu Gly His Gln Met Lys Asp Cys Thr Glu Lys Gln Ala Xaa Phe Leu
420 425 430
Gly Lys Ile Trp Pro Ser His Xaa Gly Arg Pro Gly Asn Phe Leu Gln
435 440 445
Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly
450 455 460

Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Glu Lys Asp
465 470 475 480
Leu Tyr Pro Thr Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Leu
485 490 495
Ser Gln

<210> 518
<211> 498
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (129)..(129)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (362)..(362)

<223> Xaa can be any naturally occurring amino acid
<400> 518
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Asn Lys Lys Tyr Lys Leu Lys
20 25 30
His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Asp Gly Cys Lys Gln Ile Met Lys Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Glu Ala Gln Gln Ala Ala Ala Asp Pro Gly Asn Ser Ser Gln

115 120 125

Xaa Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val
130 135 140

His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val
145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu
165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val

180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu

195 200 205

Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile
210 215 220

Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
225 230 235 240

Thr Ser Thr Leu Gln Glu Gln Ile Asn Trp Met Thr Asn Asn Pro Pro

245 250 255

Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln

275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys

325 330 335

Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Xaa Val Leu Ala Glu Ala Met

355 360 365

Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe

370 375 380

Lys Lys Gln Arg Arg Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe

450 455 460

Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Ser Ile

465 470 475 480

Asp Lys Glu Met Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn

485 490 495

Asp Pro

<210> 519

<211> 502

<

212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (74)..(74)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (280)..(280)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (290)..(290)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (409)..(409)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (461)..(461)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (501)..(501)

<223> Xaa can be any naturally occurring amino acid

<400> 519

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Ile Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Ile Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Pro Thr Gly Ser Glu Xaa Cys Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Lys Ser Asn Pro Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Xaa Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Xaa Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Ser Ala Thr Val Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Xaa Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Thr Ala Xaa Pro Glu Glu
450 455 460
Ser Phe Arg Phe Gly Glu Glu Thr Ile Pro Ser Gln Lys Gln Glu Val
465 470 475 480
Ile Asp Lys Glu Leu Tyr Pro Ser Ala Ser Leu Arg Ser Leu Phe Gly
485 490 495

Asn Asp Pro Leu Xaa Gln
500

<210> 520
<211> 501
<212> PRT
<213> Human immunodeficiency virus
<400> 520
Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Arg Leu Lys
20 25 30
His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Ile Gln Leu
50 55 60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Val Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Arg Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ala
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Met Thr Asn Ser Ala Asn Ile Met Met Gln Arg Gly Asn Phe Lys
370 375 380
Asn Gln Arg Arg Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Lys Thr Ile Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp
465 470 475 480
Lys Asp Glu Arg Tyr Pro Leu Thr Ala Leu Lys Ser Leu Phe Gly Asn
485 490 495

Asp Pro Leu Ser Gln
500

<210> 521
<211> 510
<212> PRT
<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (445)..(445)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (477)..(477)

<223> Xaa can be any naturally occurring amino acid

<400> 521

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Gly Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Asp Arg Phe Ala Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Ser Ser Leu Pro Thr Gly Ser Glu Glu Ile Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Gly Asn Ser Ser Asn Ala
115 120 125

Gly Asn Ser Ser Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn
130 135 140

Leu Gln Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn
145 150 155 160

Ala Trp Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile
165 170 175

Pro Met Phe Thr Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn
180 185 190

Thr Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu

195 200 205

Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Val His Pro

210 215 220

Val Gln Ala Gly Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly

225 230 235 240

Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp

245 250 255

Met Thr Ser Asn Pro Ala Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp

260 265 270

Ile Ile Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser

275 280 285

Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val

290 295 300

Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val

305 310 315 320

Lys Ala Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp

325 330 335

Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro Ala Pro Thr Leu Glu Glu

340 345 350

Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg

355 360 365

Val Leu Ala Glu Ala Met Ser Gln Val Thr Asn Pro Ala Ala Ile Met

370 375 380

Met Gln Lys Ser Asn Phe Arg Asn His Arg Lys Pro Val Lys Cys Phe

385 390 395 400

Asn Cys Gly Lys Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg

405 410 415

Lys Arg Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp

420 425 430

Cys Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Xaa Pro Ser His

435 440 445

Lys Gly Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala

450 455 460

Pro Ser Ala Pro Pro Ala Glu Ser Phe Arg Phe Gly Xaa Glu Thr Ala

465 470 475 480

Thr Pro Ser Gln Lys Gln Glu Pro Met Glu Lys Glu Leu Tyr Pro Ser

485 490 495

Ala Ala Leu Lys Ser Leu Phe Gly Asn Asp Pro Leu Ser Gln

500 505 510

<210> 522

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (24)..(24)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (117)..(117)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (143)..(143)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (201)..(201)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (223)..(223)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (261)..(261)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (280)..(280)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (295)..(295)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (409)..(409)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (435)..(435)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (463)..(463)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (465)..(465)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (470)..(470)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (482)..(482)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (497)..(497)

<223> Xaa can be any naturally occurring amino acid

<400> 522

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Xaa Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Xaa Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Val Val Gln Asn Leu Gln Gly Gln Met Xaa Tyr
130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Xaa Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Xaa Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Pro Gln Glu Gln Val Ala Trp Met Thr Ser Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Xaa Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Xaa Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Xaa Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Ser Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Pro Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ser Val Lys Cys Phe Asn Cys Gly Arg Glu Gly His
385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Xaa Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Xaa Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Xaa Arg
450 455 460

Xaa Gly Glu Glu Met Xaa Thr Pro Ala Gln Lys Gln Glu Pro Ile Asp
465 470 475 480
Lys Xaa Leu Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495
Xaa Ser Ser Gln
500

<210> 523
<211> 499
<212> PRT
<213> Human immunodeficiency virus
<400> 523
Met Gly Ala Arg Ala Ser Val Leu Ser Ser Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Gln Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Arg Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Glu Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Pro Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Pro Val
245 250 255

Gln Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Ala Asn Ser Thr Thr Ile Met Met Gln Arg Gly Asn Phe Lys Asn
370 375 380
Gln Arg Lys Gly Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile
385 390 395 400

Ala Arg His Cys Lys Ala Pro Arg Arg Lys Gly Cys Trp Lys Cys Gly
405 410 415
Lys Glu Gly His Gln Ile Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe
420 425 430
Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu
435 440 445
Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg Phe
450 455 460

Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Thr Val Asp Lys
465 470 475 480
Glu Leu Tyr Pro Val Thr Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro
485 490 495
Leu Ser Gln

<210> 524

<211> 506

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (7)..(7)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (189)..(189)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (386)..(386)

<223> Xaa can be any naturally occurring amino acid

<400> 524

Met Gly Ala Arg Ala Ser Xaa Leu Ser Gly Gly Gln Leu Asp Lys Trp
1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Lys Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Glu Lys Ala Gln Gln Ala Ala Ala Ala Ala Ala Thr Gly Asn Ser Ser
115 120 125

Gln Asn Ser Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu

130 135 140

Gln Gly Gln Met Val His Gln Ala Met Thr Pro Arg Thr Leu Asn Ala
145 150 155 160

Trp Val Lys Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro
165 170 175

Met Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Xaa Leu Asn Thr
180 185 190

Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Ile Leu Lys
195 200 205

Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val
210 215 220

His Ala Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser
225 230 235 240

Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met
245 250 255

Thr Asn Asn Pro Pro Ile Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile
260 265 270

Ile Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile
275 280 285

Leu Asp Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp
290 295 300

Arg Phe Tyr Lys Val Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys
305 310 315 320

Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys
325 330 335

Lys Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met
340 345 350

Met Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val
355 360 365

Leu Ala Glu Ala Met Ser Gln Met Thr Asn Ser Ala Ala Ile Met Met
370 375 380

Gln Xaa Gly Asn Phe Arg Gly Gln Arg Lys Thr Val Lys Cys Phe Asn
385 390 395 400
Cys Gly Arg Glu Gly His Ile Ala Arg Asn Cys Lys Ala Pro Arg Lys
405 410 415
Lys Gly Cys Trp Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys
420 425 430

Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Ser Ser His Lys
435 440 445
Gly Arg Pro Gly Asn Phe Val Gln Asn Arg Pro Glu Pro Thr Ala Pro
450 455 460
Pro Ala Glu Ser Phe Gly Phe Gly Glu Glu Met Thr Thr Pro Ser Gln
465 470 475 480
Thr Gln Glu Pro Lys Asp Lys Glu Leu Tyr Pro Leu Ser Ser Leu Lys
485 490 495

Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 525
<211> 508
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (214)..(214)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (377)..(377)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (393)..(393)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (405)..(405)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (411)..(411)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (429)..(429)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (469)..(469)

<223> Xaa can be any naturally occurring amino acid

<400> 525

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Gln Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Met Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Ala
35 40 45

Asn Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Met Glu Gln Leu
50 55 60

Gln Pro Ala Leu Asn Thr Gly Thr Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Lys Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Pro Gln Ala Ala Ala Ala Ala Ala Thr Gly Asn Ser Ser
115 120 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140

Ile His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160

Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Val Ala
165 170 175

Leu Ser Glu Gly Ser Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
180 185 190
Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205

Glu Glu Ala Ala Glu Xaa Asp Arg Thr His Pro Val His Ala Gly Pro
210 215 220
Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240
Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Ser Asn Pro
245 250 255
Pro Val Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Leu Gly Leu
260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg
275 280 285
Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
290 295 300
Val Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr
305 310 315 320
Glu Thr Leu Ile Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335

Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350
Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365
Met Ser Gln Val Thr Asn Ser Thr Xaa Ile Met Met Gln Asn Gly Asn
370 375 380
Phe Arg Gly Gln Arg Lys Ile Val Xaa Cys Phe Asn Cys Gly Lys Glu
385 390 395 400

Gly His Ile Ala Xaa Asn Cys Lys Ala Pro Xaa Lys Lys Gly Cys Trp
405 410 415
Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Xaa Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Gln Ser Arg Leu Glu Pro

450 455 460

Thr Ala Pro Pro Xaa Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Pro

465 470 475 480

Pro Gln Lys Gln Glu Lys Thr Asp Lys Glu Leu Tyr Pro Leu Thr Ser

485 490 495

Leu Arg Ser Leu Phe Gly Ser Asp Pro Ser Ser Gln

500 505

<210> 526

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (55)..(55)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (85)..(85)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (94)..(94)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (105)..(105)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (116)..(116)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (235)..(235)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
<222> (460)..(460)
<223> Xaa can be any naturally occurring amino acid
<400> 526

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Xaa Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Val Tyr Asn
65 70 75 80
Thr Val Ala Thr Xaa Tyr Cys Val His Gln Arg Ile Asp Xaa Lys Asp
85 90 95
Thr Lys Asp Ala Leu Asp Lys Ile Xaa Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Xaa Gln Ala Ala Ala Asp Thr Gly Asn Arg Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Arg Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Leu Thr Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Ser Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Asp Trp Asp Arg Met His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Xaa Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Asp Trp Met Thr Gly Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Tyr Arg
370 375 380
Asp Gln Arg Arg Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Xaa Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Ser Pro Gln Lys Gln Glu Pro Arg Asp
465 470 475 480

Glu Glu Leu Tyr Pro Ser Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 527

<211> 505

<212> PRT

<213> Human immunodeficiency virus

<400> 527

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Lys Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ala Leu Arg Thr Gly Ser Glu Glu Leu Lys Ser Val Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Gly Ile Asp Val Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Gln Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Thr His Pro Val His Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Ala Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Gln His Ser Thr Ala Ile Met Met Gln Asn Gly Asn Phe Arg
370 375 380
Gly Gln Lys Lys Ser Val Lys Cys Phe Asn Cys Gly Lys Val Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Ser Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Leu Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Gly

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Arg Asp Met Asn Lys Asp Leu Tyr Pro Pro Leu Ala Ser Leu Arg Ser

485 490 495

Leu Phe Gly Asn Asp His Ser Ser Gln

500 505

<210> 528

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (18)..(18)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (26)..(26)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (173)..(173)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (361)..(361)

<223

> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (476)..(476)

<223> Xaa can be any naturally occurring amino acid

<400> 528

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp
1 5 10 15

Glu Xaa Ile Arg Leu Arg Pro Gly Gly Xaa Lys Arg Tyr Lys Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Gly Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Arg Thr Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val Ser
115 120 125

Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Ile Tyr Gln
130 135 140

Ser Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu
145 150 155 160

Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Xaa Leu Ser Glu
165 170 175

Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly
180 185 190

His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala
195 200 205

Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala Pro
210 215 220

Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser
225 230 235 240

Thr Pro Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile Pro
245 250 255
Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile
260 265 270
Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly Pro
275 280 285
Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg
290 295 300

Ala Glu Gln Ala Thr Ala Glu Val Lys Asn Trp Met Thr Glu Thr Leu
305 310 315 320
Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu
325 330 335
Gly Pro Gly Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val
340 345 350
Gly Gly Pro Gly His Lys Ala Arg Xaa Leu Ala Glu Ala Met Ser Gln
355 360 365

Met Thr Asn Ser Asn Thr Ile Met Met Gln Gly Gly Asn Phe Arg Asn
370 375 380
Gln Arg Lys Lys Ile Lys Cys Phe Asn Cys Gly Arg Glu Gly His Val
385 390 395 400
Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly
405 410 415
Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe
420 425 430

Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn Phe Pro
435 440 445
Gln Ser Arg Leu Glu Pro Thr Ala Pro Pro Glu Glu Ser Leu Ser Phe
450 455 460
Arg Glu Glu Lys Thr Thr Pro Ser Gln Lys Gln Xaa Pro Ile Asp Lys
465 470 475 480
Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro

485 490 495

Ser Ser Thr

<210> 529

<211> 505

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

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<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (28)..(28)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (30)..(30)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (138)..(138)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (232)..(232)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (411)..(411)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (416)..(416)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
<222> (440)..(440)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (449)..(449)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (468)..(468)
<223> Xaa can be any naturally occurring amino acid
<400> 529

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15
Glu Arg Ile Arg Leu Arg Pro Xaa Gly Lys Lys Xaa Tyr Xaa Leu Lys

20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Ala Gly Cys Xaa Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Ile Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Xaa Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Gly
115 120 125
Ser Gly Ser Gln Val Ser Gln Asn Tyr Xaa Ile Val Gln Asn Leu Gln
130 135 140
Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp

145 150 155 160

Val Lys Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met
165 170 175
Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met
180 185 190
Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu
195 200 205
Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His

210 215 220
Ala Gly Pro Val Ala Pro Gly Xaa Met Arg Glu Pro Arg Gly Ser Asp
225 230 235 240
Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr
245 250 255
Asn Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile
260 265 270
Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu

275 280 285
Asp Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg
290 295 300
Phe Tyr Arg Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn
305 310 315 320
Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys
325 330 335
Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met

340 345 350
Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu
355 360 365
Ala Glu Ala Met Ser Gln Val Thr Asn Ser Ala Ala Ile Met Met Gln
370 375 380
Lys Gly Asn Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys
385 390 395 400
Gly Lys Glu Gly His Ile Ala Lys Asn Cys Xaa Ala Pro Arg Lys Xaa

405 410 415

Gly Cys Trp Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr

420 425 430

Glu Arg Gln Ala Asn Phe Leu Xaa Lys Ile Trp Pro Ser Tyr Lys Gly

435 440 445

Xaa Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Thr

450 455 460

Ala Pro Pro Xaa Glu Ser Phe Arg Phe Gly Glu Glu Met Thr Thr Pro

465 470 475 480

Pro Gln Lys Gln Glu Leu Ile Asp Lys Glu Leu Tyr Pro Ser Ala Ser

485 490 495

Leu Lys Ser Leu Phe Gly Asn Asp Pro

500 505

<210> 530

<211> 504

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (45)..(45)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (88)..(88)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (103)..(103)

<223> Xaa can be any naturally occurring amino acid

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<222> (106)..(106)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (121)..(121)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (351)..(351)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (380)..(380)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (486)..(486)

<223> Xaa can be any naturally occurring amino acid

<400> 530

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Xaa Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Val Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Xaa His Gln Lys Ile Asp Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Xaa Ile Glu Xaa Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Xaa Thr Gly Asn Asn Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Xaa Gly
340 345 350
Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Ala Thr Asn Ser Ala Asn Ile Met Met Gln Xaa Gly Asn Phe Lys
370 375 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Val Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Ser Gln Lys Gln
465 470 475 480
Glu Pro Ile Asp Lys Xaa Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu
485 490 495

Phe Gly Asn Asp Pro Ser Ser Gln
500

<210> 531
<211> 499
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
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<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
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<223> Xaa can be any naturally occurring amino acid
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<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
<222> (358)..(358)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
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<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (372)..(372)

<223> Xaa can be any naturally occurring amino acid

<400> 531

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Asn Trp
1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Ser Lys Arg Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Met Glu Thr Ala Glu Gly Cys Gln Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Thr Ala Asp Ala Gly Thr Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Met His Pro Val Gln Xaa Gly Pro Val Ala

210 215 220

Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Thr Trp Met Thr Ser Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Val Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Xaa Ala Cys Xaa Gly

340 345 350

Xaa Gly Gly Pro Gly Xaa Lys Ala Xaa Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Xaa Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Ile Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser Asn Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Lys Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Ser Lys Glu

465 470 475 480

Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro

485 490 495

Ser Ser Gln

<210> 532

<211> 506

<212> PRT

<213> Human immunodeficiency virus

<400> 532

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Ser Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Arg Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Met Gly Asn Ser Ser Gln Ala

115 120 125

Ser Val Ser Gln Ala Ser Val Ser Gln Asn Tyr Pro Ile Val Gln Asn

130 135 140

Leu Gln Gly Gln Met Val His Gln Pro Leu Thr Pro Arg Thr Leu Asn

145 150 155 160

Ala Trp Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile

165 170 175

Pro Met Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn

180 185 190

Thr Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu

195 200 205

Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro

210 215 220

Val His Ala Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly

225 230 235 240

Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp

245 250 255

Met Thr Asn Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp

260 265 270

Ile Ile Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Ile Ser

275 280 285

Ile Leu Asp Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val

290 295 300

Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val

305 310 315 320

Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp

325 330 335

Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu

340 345 350

Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg

355 360 365

Val Leu Ala Glu Ala Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met

370 375 380

Met Gln Lys Gly Asn Phe Arg Ser Gln Arg Lys Ile Val Lys Cys Phe

385 390 395 400

Asn Cys Gly Lys Glu Gly His Ile Ala Arg Ser Cys Arg Ala Pro Arg

405 410 415

Lys Arg Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp

420 425 430

Cys Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His

435 440 445

Lys Gly Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala

450 455 460

Pro Pro Glu Glu Ser Phe Gly Phe Gly Glu Glu Ala Thr Pro Ser Gln

465 470 475 480

Lys Gln Glu Pro Arg Asp Lys Glu Thr Tyr Pro Leu Ala Ser Leu Arg

485 490 495

Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505

<210> 533

<211> 504

<212> PRT

<213> Human immunodeficiency virus

<400> 533

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Lys Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala

210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Thr
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Cys Ile Leu Asp Ile Lys Gln Gly

275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Pro Thr Pro Ser Gln Lys Gln Glu Pro Leu Ile

465 470 475 480

Asp Leu Asp Lys Glu Leu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu

485 490 495

Phe Gly Asn Asp Pro Ser Ser Lys

500

<210> 534

<211> 504

<212> PRT

<213> Human immunodeficiency virus

<400> 534

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala

210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ile Thr Thr Pro Pro Asn Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Val Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn Phe

435 440 445

Pro Gln Ser Arg Thr Glu Pro Thr Ala Pro Pro Ala Pro Pro Glu Glu

450 455 460

Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu

465 470 475 480

Pro Pro Ile Asp Arg Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu

485 490 495

Phe Gly Asn Asp Pro Ser Ser Gln

500

<210> 535

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 535

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys

20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser Ser
115 120 125
Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140
Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160
Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala
165 170 175
Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
180 185 190
Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205
Glu Glu Ala Ala Glu Trp Asp Arg Met His Pro Val His Ala Gly Pro

210 215 220
Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240
Thr Thr Ser Thr Leu Gln Glu Gln Val Gly Trp Met Thr Ser Asn Pro

245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Thr Thr Ser Ala Ala Ala Ile Met Met Gln Arg Gly Asn

370 375 380

Phe Arg Asn Gln Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Lys Glu

385 390 395 400

Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser

450 455 460

Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro

465 470 475 480

Arg Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln
500

<210> 536

<211> 498

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (359)..(359)

<223> Xaa can be any naturally occurring amino acid

<400> 536

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Ile Ala Val Leu Phe Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Ile Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Lys Asn Asn Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His
130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Ser Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ala His Xaa Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Pro Thr Ala Ile Met Met Gln Arg Gly Asn Phe Lys
370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Ile Thr Thr Gln Lys Gln Glu Pro Ile Asp Lys Glu

465 470 475 480

Gln Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser

485 490 495

Ser Gln

<210> 537

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (440)..(440)

<223> Xaa can be any naturally occurring amino acid

<400> 537

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Glu Lys Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Pro Gly Lys Ser Ser

115 120 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met

130 135 140

Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala

165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn

195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Ala Gln Ala Gly Pro

210 215 220

Val Ala Pro Gly Gln Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Gly Asn Pro

245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Val Thr Asn Ser Gly Ala Ile Met Met Gln Lys Gly Asn

370 375 380

Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Arg Glu

385 390 395 400

Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Xaa Pro Ser His Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser

450 455 460

Phe Arg Phe Gly Glu Glu Thr Ala Thr Ser Ser Gln Lys Gln Glu Pro

465 470 475 480

Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln

500

<210> 538

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (275)..(275)

<223

> Xaa can be any naturally occurring amino acid

<400> 538

Met Gly Ala Arg Ala Ser Val Leu Ser Ala Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Gly Leu Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Ala Gln Leu

50 55 60
Tyr Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Gln Lys Ala Gln Pro Ala Ala Ala Asp Thr Gly Asn Asn Ser Lys Val

115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Xaa Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Val Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Asn Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Arg Ile Trp Pro Ser Pro Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 539

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<400> 539

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Arg Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Leu Val Ala Thr Leu Tyr Cys Val His Gln Ser Ile Asp Val Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Lys Lys Glu Gln
100 105 110

Gln Ala Ala Ala Asp Thr Gly Asn Lys Ser Gln Val Ser Gln Asn Tyr

115 120 125

Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln Ala Leu Ser
130 135 140

Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys Ala Phe
145 150 155 160

Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu Gly Ala Thr
165 170 175

Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His Gln Ala

180 185 190

Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp
195 200 205

Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala Pro Gly Gln Met
210 215 220

Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln

225 230 235 240

Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile Pro Val Gly Glu

245 250 255

Ile Tyr Lys Arg Trp Ile Ile Ile Gly Leu Asn Lys Ile Val Arg Met

260 265 270

Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro

275 280 285

Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln

290 295 300

Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln

305 310 315 320

Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro Gly

325 330 335

Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro

340 345 350

Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Val Thr Asn

355 360 365

Ser Ala Ser Ala Ser Ile Met Ala Gln Arg Gly Asn Tyr Gly Asn Gln

370 375 380

Arg Lys Ala Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile Ala

385 390 395 400

Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Lys

405 410 415

Glu Gly His Gln Met Lys Asp Cys Ala Glu Arg Gln Ala Asn Phe Leu

420 425 430

Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu Gln

435 440 445

Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro Glu Glu Ser Phe

450 455 460

Arg Phe Gly Glu Glu Lys Pro Thr Pro Ser Gln Lys Gln Glu Gln Thr

465 470 475 480

Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn

485 490 495

Asp Pro Ser Ser Gln

500

<210

> 540

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (63)..(63)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (84)..(84)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (147)..(147)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (293)..(293)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<

222> (310)..(310)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (351)..(351)

<223> Xaa can be any naturally occurring amino acid

<400> 540

Met Gly Ala Arg Ala Ser Val Leu Ser Ala Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Met Glu Thr Ser Glu Gly Cys Arg Lys Ile Leu Gly Xaa Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Xaa Leu Tyr Cys Val His Gln Lys Ile Asp Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Thr Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Asn Gln Val Ser Gln

115 120 125

Asn Tyr Pro Ile Val Gln Asn Val Gln Gly Gln Met Val His Gln Pro

130 135 140

Ile Ser Xaa Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys

145 150 155 160

Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser Glu Gly

165 170 175

Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His

180 185 190

Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala

195 200 205

Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala Pro Gly

210 215 220

Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr

225 230 235 240

Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile Pro Val

245 250 255

Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val

260 265 270

Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly Pro Lys

275 280 285

Glu Pro Phe Arg Xaa Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala

290 295 300

Glu Gln Ala Ser Gln Xaa Val Lys Asn Trp Met Thr Glu Thr Leu Leu
305 310 315 320
Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Arg Ala Leu Gly
325 330 335
Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Xaa Gly
340 345 350
Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Val

355 360 365

Thr Asn Ser Thr Ala Ile Met Met Gln Lys Gly Asn Phe Arg Gly Gln
370 375 380
Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile Ala
385 390 395 400
Lys Asn Cys Arg Ala Pro Arg Arg Lys Gly Cys Trp Lys Cys Gly Lys
405 410 415
Glu Gly His Gln Ile Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe Leu

420 425 430

Gly Lys Ile Trp Pro Ser Ser Lys Gly Gly Arg Pro Gly Asn Phe Leu
435 440 445
Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Ser Phe
450 455 460
Gly Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Thr Asn
465 470 475 480
Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 541

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (477)..(477)

<223> Xaa can be any naturally occurring amino acid

<400> 541

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Ala Gln Leu
50 55 60

Gln Pro Ser Ile Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Val Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His
130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Gly Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Thr Ala Ile Met Met Gln Arg Gly Asn His Arg
370 375 380
Asn Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415

Gly Gln Glu Gly His Gln Met Lys Glu Cys Pro Gly Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Val Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460

Phe Gly Glu Glu Thr Thr Thr Leu Ser Gln Lys Gln Xaa Pro Thr Asp
465 470 475 480

Lys Glu Met Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 542

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (18)..(18)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (187)..(187)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (375)..(375)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (390)..(390)

<223> Xaa can be any naturally occurring amino acid

<400> 542

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15

Glu Xaa Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr His Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Ile Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Asn Ile Asp Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gly Ser

115 120 125

Lys Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met

130 135 140

Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala

165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Xaa Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn

195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro

210 215 220

Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro

245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335
Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350
Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365

Met Ser Gln Val Thr Ser Xaa Pro Thr Ile Met Met Gln Lys Gly Asn
370 375 380
Phe Arg Asn Pro Lys Xaa Thr Val Lys Cys Phe Asn Cys Gly Arg Glu
385 390 395 400
Gly His Ile Ala Lys His Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp
405 410 415
Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln
420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly
435 440 445
Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser
450 455 460
Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Thr
465 470 475 480
Ile Asn Lys Asp Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly
485 490 495

Asn Asp Pro Ser Ser Gln
500

<210> 543
<211> 502
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (15)..(15)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature

<222> (20)..(20)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (25)..(25)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (30)..(30)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (61)..(61)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (74)..(74)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (95)..(95)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (102)..(102)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (123)..(123)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (492)..(492)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (500)..(500)

<223> Xaa can be any naturally occurring amino acid

<400> 543

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Xaa Trp

1 5 10 15

Glu Lys Ile Xaa Leu Arg Pro Gly Xaa Lys Lys Gln Tyr Xaa Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Xaa Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Thr Glu Xaa Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Xaa Asp

85 90 95

Thr Lys Glu Ala Leu Xaa Lys Ile Glu Glu Glu Gln Thr Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Xaa Asn Ser Ser Gln Ile

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Asp Glu

195 200 205

Ala Ala Glu Trp Asp Arg Ile His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Pro Val

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365
Gln Val Thr Asn Ser Asn Ala Val Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Arg Ser Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430
Phe Leu Gly Arg Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Ala Glu Ser Phe Met
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Ser Lys Asp
465 470 475 480
Arg Asp Lys Glu Thr Tyr Pro Leu Ala Ser Leu Xaa Ser Leu Phe Gly

485 490 495
Asn Asp Pro Xaa Ser Gln
500

<210> 544

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<400> 544

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Gln Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Ile Ala Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Ser Asn Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Ser Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Val

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Pro Ala Ala Ile Met Met Gln Arg Gly Asn Phe Lys

370 375 380

Asn Gln Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Lys Asp Gly His

385 390 395 400

Ile Ser Arg Asn Cys Lys Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Gln Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Asn Arg Thr Val Pro Thr Ala Pro Pro Glu Glu Ser Leu Arg

450 455 460

Phe Gly Glu Glu Thr Thr Pro Ser Gln Lys Gln Glu Pro Val Asp Lys

465 470 475 480

Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro

485 490 495

Ser Ser Gln

<210> 545

<211> 505

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

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<220><221> misc_feature

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<222> (287)..(287)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

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222> (303)..(303)

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<220><221> misc_feature

<222> (305)..(305)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (323)..(323)

<223> Xaa can be any naturally occurring amino acid

<400> 545

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys

20 25 30

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His Ile Val Trp Ala Ser Arg Glu Leu Asp Arg Phe Ala Leu Asn Pro
        35                  40                  45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Glu Gln Leu
    50                  55                  60
Gln Pro Ala Leu Lys Thr Gly Thr Glu Glu Ile Arg Ser Leu Tyr Asn
65                  70                  75                  80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Gly Ile Glu Val Lys Asp
                85                  90                  95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
            100                 105                 110
Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Ala Gly Asn Asn Ser
        115                 120                 125
Gln Val Ser Arg Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met
    130                 135                 140
Val His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145                 150                 155                 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala
                165                 170                 175
Leu Ala Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
            180                 185                 190
Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
        195                 200                 205
Glu Glu Xaa Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro
    210                 215                 220

Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225                 230                 235                 240
Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Xaa Asn Pro
                245                 250                 255
Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu
            260                 265                 270
Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Xaa Arg
```

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Xaa Lys
290 295 300
Xaa Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr
305 310 315 320
Glu Thr Xaa Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335
Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365
Met Ser Gln Val Thr Asn Ser Ala Thr Val Met Met Gln Lys Ser Asn
370 375 380
Phe Arg Asn Gln Arg Lys Ser Val Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400
Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp
405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln
420 425 430
Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly
435 440 445
Asn Phe Leu Gln Arg Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro
450 455 460
Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys
465 470 475 480

Gln Glu Gln Val Asp Lys Glu Met Tyr Pro Leu Ala Ser Leu Arg Ser
485 490 495
Leu Phe Gly Asn Asp Pro Ser Ser Pro
500 505

<210> 546

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

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<220><221> misc_feature

<222> (489)..(489)

<223> Xaa can be any naturally occurring amino acid

<400> 546

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Ile Gly Cys Lys Gln Ile Leu Glu Gln Leu

50 55 60

Gln Ser Ala Leu Xaa Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Leu Val Ala Thr Leu Tyr Cys Val His Gln Gly Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Val Gln Gln Ala Ala Ala Asp Thr Gly Asn Gln Val Ser Gln

115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val

130 135 140

His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val

145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu

165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val

180 185 190

Gly Gly His Gln Ala Ala Met Gln Ile Leu Lys Glu Thr Ile Asn Glu

195 200 205

Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile

210 215 220

Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr

225 230 235 240

Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro

245 250 255

Ile Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln

275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Leu Leu Lys

325 330 335

Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Ser Gln Ile Asn Ser Ala Ala Thr Thr Val Met Met Gln Arg Gly Asn

370 375 380

Phe Lys Asn Gln Arg Arg Thr Val Lys Cys Phe Asn Cys Gly Lys Glu

385 390 395 400

Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Leu Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly
435 440 445
Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser

450 455 460
Phe Arg Phe Gly Glu Glu Lys Thr Thr Pro Ser Gln Lys Gln Glu Pro
465 470 475 480
Met Asp Lys Glu Leu Tyr Pro Leu Xaa Ser Leu Arg Ser Leu Phe Gly
485 490 495
Asn Asp Pro Ser Ser Gln
500

<210> 547

<211> 506

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (468)..(468)

<223

> Xaa can be any naturally occurring amino acid

<400> 547

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Asp Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Asp Gly Cys Lys Gln Ile Leu Ala Gln Leu

50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Ser Gln

115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val

130 135 140

His Gln Pro Leu Thr Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile

145 150 155 160

Glu Glu Lys Asn Phe Ser Pro Glu Ile Ile Pro Met Phe Thr Ala Leu

165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val

180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu

195 200 205

Glu Ala Ala Glu Trp Asp Arg Ser His Pro Val His Ala Gly Pro Ile

210 215 220

Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr

225 230 235 240

Thr Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro

245 250 255

Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Val Leu Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln

275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Arg

325 330 335

Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Ala His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Ser Gln Val Thr Asn Ser Asn Thr Ile Met Met Gln Lys Gly Asn Phe

370 375 380

Arg Gly Gln Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Lys Asn Cys Arg Ala Pro Arg Arg Arg Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser Asn Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe

450 455 460

Arg Phe Gly Xaa Glu Ala Ala Thr Pro Ser Gln Lys Gln Glu Gln Leu

465 470 475 480

Ile Asp Leu Asp Arg Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg

485 490 495

Ser Leu Phe Gly Ser Asp Pro Ser Ser Lys

500 505

<210> 548

<211> 509

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (40)..(40)

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<220><221> misc_feature

<222> (57)..(57)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (62)..(62)

<223> Xaa can be any naturally occurring amino acid

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<222> (66)..(66)

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222> (84)..(84)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

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<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (166)..(166)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (197)..(197)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

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<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (320)..(320)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (326)..(326)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (331)..(331)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (388)..(388)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (391)..(391)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (408)..(408)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (420)..(420)

<223> Xaa can be any naturally occurring amino acid

<400> 548

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Xaa Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Xaa Arg Gln Ile Leu Xaa Gln Leu
50 55 60

Gln Xaa Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Xaa Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Val Glu Glu Glu Gln Asn Lys Ser Xaa
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Gly Thr Gly Asn Asn Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Xaa Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Xaa Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Xaa Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Xaa

305 310 315 320

Leu Leu Val Gln Asn Xaa Asn Pro Asp Cys Xaa Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Asn Ser Ser Thr Met Met Met Gln Arg Gly Asn Phe Arg Asn

370 375 380

Gln Arg Lys Xaa Val Lys Xaa Phe Asn Cys Gly Lys Glu Gly His Ile

385 390 395 400

Ala Lys Asn Cys Arg Ala Pro Xaa Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415

Lys Glu Gly Xaa Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Asn Arg Pro Glu Gln Asn Arg Pro Glu Pro Ser Arg Pro Glu Pro

450 455 460

Ser Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Ala Thr

465 470 475 480

Pro Pro Gln Lys Gln Glu Thr Ile Asp Lys Glu Leu Tyr Pro Leu Thr

485 490 495

Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505

<210> 549

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (124)..(124)

<223> Xaa can be any naturally occurring amino acid

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<222> (246)..(246)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (389)..(389)

<223

> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (444)..(444)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (475)..(475)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (481)..(481)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (494)..(494)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (502)..(502)

<223> Xaa can be any naturally occurring amino acid

<400> 549

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Ile Arg Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Glu Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Thr Ala Ala Asp Xaa Gly Asn Ser Asn
115 120 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140

Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160

Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala
165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro

210 215 220

Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Thr Leu Xaa Glu Gln Ile Gly Trp Met Thr Asn Asn Pro

245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Val Thr Asn Ser Ala Ser Met Met Met Gln Arg Ser Asn

370 375 380

Phe Lys Asn Gln Xaa Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu

385 390 395 400

Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Ile Phe Leu Gly Lys Ile Trp Pro Ser His Xaa Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser

450 455 460

Phe Met Phe Gly Glu Glu Thr Thr Thr Pro Xaa Gln Lys Gln Glu Pro

465 470 475 480

Xaa Asp Gln Gly Leu Tyr Pro Leu Ala Ser Leu Lys Ser Xaa Phe Gly

485 490 495

Asn Asp Pro Ser Ser Xaa

500

<210> 550

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

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<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (55)..(55)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (88)..(88)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (111)..(111)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (120)..(120)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (131)..(131)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (138)..(138)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (184)..(184)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (258)..(258)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (275)..(275)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (284)..(284)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (292)..(292)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (312)..(312)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (341)..(341)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (371)..(371)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (453)..(453)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (477)..(477)

<223> Xaa can be any naturally occurring amino acid

<400> 550

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Xaa Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Xaa Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60
Gln Pro Ser Leu Lys Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80
Thr Ile Ala Thr Leu Trp Cys Xaa His Arg Gly Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Xaa Lys
100 105 110
Lys Lys Ala Gln Gln Glu Thr Xaa Ser Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Xaa Tyr Pro Ile Val Arg Asn Xaa Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Xaa Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Glu Glu Gln Ile Ala Trp Ile Thr Asn Asn Pro Pro Val
245 250 255
Pro Xaa Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Xaa Met Tyr Ser Pro Thr Ser Ile Leu Xaa Ile Arg Gln Gly
275 280 285

Pro Lys Glu Xaa Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Xaa Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Xaa Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Xaa Asn Ser Thr Ala Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Xaa Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Xaa Gln Ile Asn
465 470 475 480

Lys Asp Met Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln
500

<210> 551

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (460)..(460)

<223> Xaa can be any naturally occurring amino acid

<400> 551

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Arg Lys Arg Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ser Leu Pro Val Gly Ser Glu Glu Ile Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Pro Thr Ala Ala Gly Ala Gly Ser Ser Ser Gln Ala
115 120 125

Ser Gln Asn Phe Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Asn Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Arg Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Xaa Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Thr Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 552

<211> 509

<212> PRT

<213> Human immunodeficiency virus

<400> 552

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Gln Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Thr Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Val Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Lys Gln Ile Leu Glu His Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Ala Val Ala Val Leu Cys Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Lys Ala Gln Gln Glu Ala Ala Asp Thr

115 120 125

Gly Asn Ser Asn Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu

130 135 140

Gln Gly Gln Met Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala

145 150 155 160

Trp Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro

165 170 175

Met Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Ala Asp Leu Asn Thr

180 185 190

Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys

195 200 205

Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val

210 215 220

His Ala Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser

225 230 235 240

Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met

245 250 255

Thr His Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile

260 265 270

Ile Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile

275 280 285

Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp

290 295 300

Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys

305 310 315 320

Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys

325 330 335

Lys Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met

340 345 350

Met Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val

355 360 365

Leu Ala Glu Ala Met Ser Gln Val Thr Asn Ser Asn Thr Ile Met Met

370 375 380

Gln Arg Gly Asn Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn

385 390 395 400

Cys Gly Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys

405 410 415

Lys Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys

420 425 430

Val Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys

435 440 445

Gly Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro

450 455 460

Leu Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu

465 470 475 480

Arg Ala Thr Pro Ser Gln Lys Pro Glu Pro Ile Asp Lys Asp Arg Tyr

485 490 495

Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro

500 505

<210> 553

<211> 507

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (319)..(319)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (424)..(424)

<223> Xaa can be any naturally occurring amino acid

<400> 553

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Gln Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Arg Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Ala Asp Thr Gly Asn Asn

115 120 125

Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln
130 135 140
Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160
Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser
165 170 175
Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn

180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205
Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly
210 215 220
Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240
Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn

245 250 255

Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly
260 265 270
Leu Asn Lys Ile Val Lys Met Tyr Ser Pro Val Ser Ile Leu Asp Ile
275 280 285
Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr

290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Xaa Met

305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile

325 330 335

Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Ala Ala

340 345 350

Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu

355 360 365

Ala Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly

370 375 380

Asn Phe Lys Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys

385 390 395 400

Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Arg Lys Gly Cys

405 410 415

Trp Lys Cys Gly Lys Glu Gly Xaa Gln Leu Lys Asp Cys Ala Glu Arg

420 425 430

Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro

435 440 445

Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu

450 455 460

Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Asp

465 470 475 480

Pro Lys Gln Asp Pro Ile Asp Lys Glu Met Tyr Pro Leu Thr Ser Leu

485 490 495

Arg Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505

<210> 554

<211> 505

<212> PRT

<213> Human immunodeficiency virus

<400> 554

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Asn Ser Thr Gly
115 120 125

Asn Ser Ser Glu Val Ser Arg Asn Phe Pro Ile Val Gln Asn Leu Gln
130 135 140

Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp
145 150 155 160

Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met
165 170 175

Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met
180 185 190

Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu
195 200 205

Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Gln Gln
210 215 220

Ala Gly Pro Ile Ala Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp
225 230 235 240

Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Thr Trp Met Thr

245 250 255

Asn Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile

260 265 270

Leu Gly Leu His Lys Ile Val Arg Met Tyr Ser Pro Ser Ser Ile Leu

275 280 285

Asp Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg

290 295 300

Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn

305 310 315 320

Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys

325 330 335

Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met

340 345 350

Thr Ala Cys Gln Gly Val Gly Gly Pro Ala His Lys Ala Arg Val Leu

355 360 365

Ala Glu Ala Met Ser His Val Thr Asn Ser Ala Thr Ile Met Met Gln

370 375 380

Lys Gly Asn Phe Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys

385 390 395 400

Gly Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys

405 410 415

Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr

420 425 430

Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly

435 440 445

Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro

450 455 460

Glu Glu Ser Phe Arg Phe Gly Glu Gly Thr Ala Ile Pro Ser Gln Lys

465 470 475 480

Gln Glu Pro Ile Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser

485 490 495

Leu Phe Gly Asn Asp His Ser Ser Gln

500 505

<210> 555

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (40)..(40)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (76)..(76)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (92)..(92)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (123)..(123)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (126)..(126)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (146)..(146)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (202)..(202)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (302)..(302)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (364)..(364)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (450)..(450)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (471)..(471)

<223> Xaa can be any naturally occurring amino acid

<400> 555

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Xaa Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Xaa Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Xaa Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Val Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Ala Ala Ala Asp Thr Lys Xaa Ser Ser Xaa Val Ser
115 120 125

Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln
130 135 140

Pro Xaa Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu
145 150 155 160

Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser Glu
165 170 175

Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly

180 185 190

His Gln Ala Ala Met Gln Met Leu Lys Xaa Thr Ile Asn Glu Glu Ala

195 200 205

Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala Pro

210 215 220

Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser

225 230 235 240

Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro

245 250 255

Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile

260 265 270

Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly Pro

275 280 285

Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Xaa Leu Arg

290 295 300

Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu

305 310 315 320

Leu Val Gln Asn Ala Asn Pro Asp Cys Arg Thr Ile Leu Lys Ala Leu

325 330 335

Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val

340 345 350

Gly Gly Pro Ala His Lys Ala Arg Val Leu Ala Xaa Ala Met Ser Gln

355 360 365

Val Thr Asn Pro Thr Thr Ile Met Met Gln Arg Gly Asn Leu Arg Asn

370 375 380

Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile

385 390 395 400

Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415

Lys Lys Gly His Gln Leu Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu
435 440 445

Gln Xaa Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe
450 455 460

Gly Glu Glu Thr Thr Thr Xaa Pro Gln Lys Gln Glu Pro Ile Asp Lys
465 470 475 480

Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro
485 490 495

Ser Ser Gln

<210> 556
<211> 489
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (446)..(446)
<223> Xaa can be any naturally occurring amino acid
<400> 556

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Lys Tyr Gln Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Lys Gln Ile Leu Gln Gln Leu
50 55 60

Gln Pro Ser Leu Arg Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Ala Val Ala Thr Leu Tyr Cys Val His Gln Gly Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Val Glu Glu Glu Gln Asn Glu Ser Lys
100 105 110

Lys Gln Thr Gln Gln Ala Ala Ala Gly Thr Gly Asn Asn Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Asn Ala
210 215 220

Pro Gly Gln Leu Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro Pro Ile
245 250 255
Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Arg Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Val Met Met Gln Lys Gly Asn Leu Gly

370 375 380

Asn Gln Arg Lys Phe Val Lys Cys Phe Asn Cys Gly Lys Ala Gly His

385 390 395 400

Ile Ser Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Asn Phe Pro Gln Ser Arg Thr Glu Pro Thr Xaa Pro Pro

435 440 445

Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Pro Ser Gln Lys Gln

450 455 460

Glu Lys Thr Asp Lys Glu Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser

465 470 475 480

Leu Phe Gly Asn Asp Pro Ser Ser Gln

485

<210> 557

<211> 512

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (46)..(46)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (74)..(74)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (90)..(90)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (93)..(93)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
<222> (109)..(109)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (124)..(124)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (127)..(127)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (168)..(168)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (179)..(179)
<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
<222> (201)..(201)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (264)..(264)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (273)..(273)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (284)..(284)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (392)..(392)
<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (466)..(466)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (490)..(490)

<223> Xaa can be any naturally occurring amino acid

<400> 557

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Xaa Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Ile Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Xaa Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Xaa Lys Ile Xaa Val Arg Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Xaa Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Xaa Asn Ser Xaa Asn
115 120 125

Ser Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly
130 135 140

Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val
145 150 155 160

Lys Val Val Glu Glu Lys Ala Xaa Ser Pro Glu Val Ile Pro Met Phe
165 170 175

Ser Ala Xaa Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu
180 185 190

Asn Thr Val Gly Gly His Gln Ala Xaa Met Gln Met Leu Lys Glu Thr
195 200 205

Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala
210 215 220
Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile

225 230 235 240
Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His
245 250 255
Asn Pro Pro Ile Pro Val Gly Xaa Ile Tyr Lys Arg Trp Ile Ile Leu
260 265 270
Xaa Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Xaa Ser Ile Leu Asp
275 280 285
Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe

290 295 300
Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp
305 310 315 320
Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr
325 330 335
Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr
340 345 350
Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala

355 360 365
Glu Ala Met Ser Gln Ala Thr Asn Ser Ala Ala Ile Met Met Gln Arg
370 375 380
Gly Asn Phe Arg Asn Gln Arg Xaa Thr Ile Lys Cys Phe Asn Cys Gly
385 390 395 400
Lys Glu Gly His Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly
405 410 415
Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu

420 425 430
Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg
435 440 445
Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Arg

450 455 460

Pro Xaa Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu

465 470 475 480

Thr Ala Thr Pro Ala Gln Lys Gln Glu Xaa Lys Asp Lys Glu Leu Tyr

485 490 495

Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Ser Asp Pro Ser Leu Gln

500 505 510

<210> 558

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (11)..(11)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (164)..(164)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222

> (183)..(183)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (195)..(195)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (459)..(459)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (475)..(475)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (493)..(493)

<223> Xaa can be any naturally occurring amino acid

<400> 558

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Xaa Lys Leu Asp Ala Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gln Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Gln Ala Gln Gln Ala Ala Ala Asn Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ser Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Xaa Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Xaa Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Xaa Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Ala Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Ile Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Asn Ser Thr Ala Val Met Met Gln Arg Gly Asn Phe Arg Asn

370 375 380

Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile

385 390 395 400

Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Arg Cys Gly

405 410 415

Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Phe Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Xaa Glu Ser Phe Arg Phe

450 455 460

Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Xaa Glu Leu Ile Asp Leu

465 470 475 480

Asp Lys Glu Leu Tyr Pro Ser Ala Ser Leu Lys Ser Xaa Phe Gly Asn

485 490 495

Asp Pro Ser Ser Lys

500

<210> 559

<211> 504

<212> PRT

<213> Human immunodeficiency virus

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<223> Xaa can be any naturally occurring amino acid

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<222> (489)..(489)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (501)..(501)

<223> Xaa can be any naturally occurring amino acid

<400> 559

Met Gly Ala Arg Ala Ser Val Ile Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly His Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Gly Ala Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Val Gln Gln Ala Ala Ala Ala Thr Ala Ala Asp Thr Gly Ser

115 120 125

Asn Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly

130 135 140

Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val

145 150 155 160

Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe

165 170 175

Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu

180 185 190

Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr

195 200 205

Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala

210 215 220

Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile

225 230 235 240

Ala Gly Thr Thr Ser Thr Xaa Gln Xaa Gln Ile Gly Trp Met Thr Asn

245 250 255

Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu

260 265 270

Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Xaa Asp

275 280 285

Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe

290 295 300

Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp

305 310 315 320

Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr

325 330 335

Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr

340 345 350

Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Ile Leu Ala

355 360 365

Glu Ala Met Ser Gln Val Thr Asn Pro Ala Thr Ile Met Met Gln Arg

370 375 380

Gly Asn Phe Arg Gly Gln Gly Arg Pro Val Lys Cys Phe Asn Cys Gly

385 390 395 400

Lys Glu Gly His Ile Ala Xaa Asn Cys Lys Ala Pro Arg Lys Lys Gly

405 410 415

Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Asn Glu

420 425 430

Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg

435 440 445

Pro Gly Asn Phe Leu Gln Ser Xaa Pro Glu Pro Thr Ala Pro Pro Met

450 455 460

Glu Ser Phe Lys Phe Gly Glu Glu Thr Thr Thr Pro Xaa Gln Lys Gln

465 470 475 480

Glu Pro Thr Asp Lys Glu Met Tyr Xaa Leu Ala Ser Leu Lys Ser Leu

485 490 495

Phe Gly Asn Asp Xaa Ser Ser Gln

500

<210> 560

<211> 498

<212> PRT

<213> Human immunodeficiency virus

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

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<222> (138)..(138)

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<222> (143)..(143)

<223> Xaa can be any naturally occurring amino acid

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<222> (173)..(173)

<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

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<222> (387)..(387)

<223> Xaa can be any naturally occurring amino acid

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<222> (430)..(430)

<223> Xaa can be any naturally occurring amino acid

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<222> (463)..(463)

<223> Xaa can be any naturally occurring amino acid

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<222> (474)..(474)

<223> Xaa can be any naturally occurring amino acid

<400> 560

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Asp Leu Asp Arg Trp
1 5 10 15

Xaa Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Xaa Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Ala Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Ile Xaa Glu Glu Glu Gln Asn Lys Gly Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Gly Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Xaa Gln Gly Gln Met Xaa His
130 135 140
Gln Ala Ile Ala Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Xaa Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala

210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Xaa
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile
245 250 255
Pro Xaa Gly Glu Ile Tyr Lys Arg Trp Ile Val Met Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Xaa Ser Pro Thr Ser Ile Leu Asp Xaa Arg Gln Gly

275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Xaa Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Xaa Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Asn Pro Asn Ala Ile Met Met Gln Arg Gly Asn Phe Arg Asn

370 375 380

Gln Arg Xaa Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile

385 390 395 400

Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415

Gln Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Xaa Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Pro

435 440 445

Gln Ser Arg Thr Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Xaa Phe

450 455 460

Gly Glu Glu Thr Thr Pro Pro Gln Lys Xaa Gly Gln Lys Asp Lys Glu

465 470 475 480

Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser

485 490 495

Ser Gln

<210> 561

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (114)..(114)

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<220><221> misc_feature

<222> (202)..(202)

<223> Xaa can be any naturally occurring amino acid

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<222> (326)..(326)

<223> Xaa can be any naturally occurring amino acid

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<222> (351)..(351)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (503)..(503)

<223> Xaa can be any naturally occurring amino acid

<400> 561

Met Gly Ala Arg Ala Ser Val Leu Arg Gly Gly Asp Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Thr Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Leu Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Xaa Ala Gln Gln Ala Gln Gln Thr Glu Ala Ala Thr Gly Asn Asn
115 120 125

Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln
130 135 140

Met Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys

145 150 155 160

Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser

165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn

180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Xaa Met Leu Lys Glu Thr Ile

195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Met His Pro Val His Ala Gly

210 215 220

Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala

225 230 235 240

Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn

245 250 255

Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly

260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile

275 280 285

Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr

290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Thr Gln Asp Val Lys Asn Trp Met

305 310 315 320

Thr Glu Thr Leu Leu Xaa Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile

325 330 335

Leu Lys Ala Met Gly Pro Gly Val Thr Leu Glu Glu Met Met Xaa Ala

340 345 350

Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu

355 360 365

Ala Met Ser Gln Val Thr Asn Ser Thr Asn Ile Met Met Gln Arg Gly

370 375 380

Asn Phe Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Gln Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Val Pro Thr Ala Pro Pro Ala Glu
450 455 460
Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu

465 470 475 480
Gln Ile Asp Lys Asp Pro Ser Pro Leu Ala Ser Leu Arg Ser Leu Phe
485 490 495
Gly Asn Asp Pro Ser Ser Xaa
500

<210> 562
<211> 506
<212> PRT
<213> Human immunodeficiency virus
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<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (389)..(389)
<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
<222> (392)..(392)
<223> Xaa can be any naturally occurring amino acid
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<222> (395)..(395)
<223> Xaa can be any naturally occurring amino acid
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<222> (405)..(405)
<223> Xaa can be any naturally occurring amino acid
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<222> (416)..(416)
<223> Xaa can be any naturally occurring amino acid
<400> 562

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Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1               5                  10                  15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
            20                  25                  30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
        35                  40                  45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
    50                  55                  60
Tyr Pro Ala Leu Asn Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65                  70                  75                  80

Thr Val Ala Thr Leu Tyr Cys Val His Lys Glu Ile Glu Val Lys Asp
                85                  90                  95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Thr Asn Lys
            100                 105                 110
Lys Lys Glu Gln Gln Ala Ala Ala Asp Thr Gly Asn Arg Ser Gln Val
        115                 120                 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
    130                 135                 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145                 150                 155                 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
                165                 170                 175
Xaa Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
            180                 185                 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
        195                 200                 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Pro Ala Gly Pro Val Ala
    210                 215                 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225                 230                 235                 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
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245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Arg Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Ile Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Val Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asp Pro Arg Lys Xaa Val Lys Xaa Phe Asn Xaa Gly Lys Thr Gly His

385 390 395 400

Ile Ala Lys Asn Xaa Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Xaa

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Asn Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Arg Val Trp Pro Phe His Lys Glu Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Ala Pro Thr Ala Pro Thr Glu Pro Thr Ala Pro

450 455 460

Pro Glu Glu Ser Phe Arg Phe Gly Glu Gly Thr Ala Thr Pro Pro Gln

465 470 475 480

Lys Gln Glu Pro Ile Asp Lys Asp Leu Tyr Pro Leu Ala Ser Leu Lys

485 490 495

Ser Leu Phe Gly Asn Asp Pro Leu Ser Gln

500 505

<210> 563

<211> 504

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (46)..(46)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (62)..(62)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (211)..(211)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (410)..(410)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (482)..(482)

<223> Xaa can be any naturally occurring amino acid

<400> 563

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Xaa Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Xaa Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Pro Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Gln Ala Ala Ala Gly Thr Gly Asn Ser Ser Gln
115 120 125
Val Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly
130 135 140

Gln Met Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val
145 150 155 160
Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe
165 170 175
Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu
180 185 190
Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr
195 200 205

Ile Asn Xaa Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala
210 215 220
Gly Pro Val Ala Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile
225 230 235 240
Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr His
245 250 255
Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu
260 265 270

Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp
275 280 285
Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe
290 295 300
Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp
305 310 315 320
Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr

325 330 335

Ile Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr
340 345 350
Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala
355 360 365
Glu Ala Met Ser Gln Val Thr Asn Ala Gly Asn Ile Met Met Gln Arg
370 375 380
Gly Asn Phe Lys Asn Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly
385 390 395 400

Lys Glu Gly His Leu Ala Arg Asn Cys Xaa Ala Pro Arg Lys Lys Gly
405 410 415
Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu
420 425 430
Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg
435 440 445
Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu
450 455 460

Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln
465 470 475 480
Glu Xaa Ile Asp Lys Glu Val Tyr Pro Leu Thr Ser Leu Lys Ser Leu
485 490 495
Phe Gly Asn Asp Pro Ser Ser Gln
500

<210> 564
<211> 499
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
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<220><221> misc_feature

<222> (307)..(307)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (460)..(460)

<223> Xaa can be any naturally occurring amino acid

<400> 564

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Asp Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Gln Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Lys Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ala Leu Arg Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Asn Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Arg Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala
210 215 220
Pro Gly Xaa Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240
Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300
Arg Ala Xaa Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365
Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Ser Phe Arg
370 375 380
Asn Gln Arg Arg Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Xaa Glu Ser Phe Arg

450 455 460

Phe Gly Lys Glu Thr Thr Pro Pro Gln Lys Gln Glu Ser Ile Asp Lys

465 470 475 480

Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro

485 490 495

Ser Ser Gln

<210> 565

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (120)..(120)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (384)..(384)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (458)..(458)

<223> Xaa can be any naturally occurring amino acid

<400> 565

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Lys Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Pro Thr Gly Ser Glu Glu Ile Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Arg Ile Glu Glu Glu Gln Asn Lys Cys Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Xaa Asp Ala Glu Lys Ser Asn Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Pro Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Ala Gln Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Thr Val Met Met Gln Arg Gly Asn Phe Xaa
370 375 380
Asn Gln Lys Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400
Leu Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Arg Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Ser Ala Xaa Pro Glu Glu Ser Phe Arg

450 455 460
Phe Gly Glu Glu Thr Thr Ala Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480
Lys Asp Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln
500

<210> 566

<211> 508

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (27)..(27)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (41)..(41)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (89)..(89)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (98)..(98)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (102)..(102)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (128)..(128)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (178)..(178)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (410)..(410)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (483)..(483)

<223> Xaa can be any naturally occurring amino acid

<400> 566

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Xaa Arg Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Xaa Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val Xaa Gln Gly Ile Glu Val Lys Asp

85 90 95

Thr Xaa Glu Ala Leu Xaa Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Ser Cys Ser Gln Xaa

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His

130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Xaa Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Ala Gln Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Thr Asn Ser Ala Thr Met Met Met Gln Arg Gly Asn Phe Lys

370 375 380

Asn Pro Gly Lys Asn Ile Lys Cys Phe Asn Cys Gly Lys Gln Gly His

385 390 395 400

Thr Ala Lys Asn Cys Arg Ala Pro Arg Xaa Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ala His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Asp Pro Thr Ala Pro Ser Arg Thr Glu Pro Thr

450 455 460

Ala Pro Pro Glu Glu Ser Phe Lys Cys Arg Glu Glu Ile Thr Thr Pro

465 470 475 480

Pro Gln Xaa Gln Glu Pro Ile Asp Gln Gly Gln Tyr Pro Leu Thr Ser

485 490 495

Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505

<210> 567

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 567

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Arg Leu Lys

```
            20                  25                  30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
        35                  40                  45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Ser Gln Leu
    50                  55                  60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65                  70                  75                  80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Arg Asp
                85                  90                  95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
            100                 105                 110
Lys Lys Ala Gln Pro Ala Ala Ala Ala Thr Gly Asn Ser Ser Gln Asp
        115                 120                 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
    130                 135                 140

Gln Pro Ile Ser Ala Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145                 150                 155                 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
                165                 170                 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
            180                 185                 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
        195                 200                 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
    210                 215                 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225                 230                 235                 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
                245                 250                 255
Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
            260                 265                 270
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Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Val Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Ser Ala Thr Val Met Met Gln Lys Gly Asn Phe Arg
370 375 380

Asn Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Leu Trp Pro Ser Gln Gln Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Ala Glu Ser Phe Arg
450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Gly Pro Ile Asp
465 470 475 480

Glu Gly Lys Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 568

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (16)..(16)

<223> Xaa can be any naturally occurring amino acid

<400> 568

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Gln Xaa

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Pro Glu Gly Cys Arg Gln Ile Leu Gly Gln Ile

50 55 60

Gln Pro Ser Leu Asn Thr Gly Thr Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asn Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Gln Lys Thr Gln Gln Ala Ala Ala Asp Thr Gly Ser Ser Ser Ser Ser

115 120 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met

130 135 140

Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala

165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn

195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Met Gln Ala Gly Pro

210 215 220

Val Ala Pro Gly Gln Ile Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Ser Asn Pro

245 250 255

Pro Val Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Ala Ala Ser Leu Glu Glu Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Val Thr Thr Pro Pro Thr Ile Met Met Gln Arg Gly Asn

370 375 380

Phe Arg Asn Gln Arg Arg Thr Ile Lys Cys Phe Asn Cys Gly Arg Glu

385 390 395 400

Gly His Val Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser

450 455 460

Phe Arg Ser Gly Glu Glu Thr Ala Ile Pro Ser Gln Lys Gln Asp Gln

465 470 475 480

Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln

500

<210> 569

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (12)..(12)

<223

> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (82)..(82)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (91)..(91)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (97)..(97)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (382)..(382)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (482)..(483)

<223

> Xaa can be any naturally occurring amino acid

<400> 569

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Xaa Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Met Glu Thr Ala Glu Gly Cys Lys Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Xaa Ala Val Leu Tyr Cys Val His Gln Xaa Ile Asp Val Lys Asp

85 90 95

Xaa Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Thr Lys Ser Lys

100 105 110

Lys Lys Val Gln Gln Val Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Gln Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Ala Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Xaa Phe Arg

370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Lys Ala Pro Arg Arg Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Arg Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Gly
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Thr Asp
465 470 475 480
Lys Xaa Xaa Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495
Pro Leu Ser Gln
500

<210> 570

<211> 498
<212> PRT
<213> Human immunodeficiency virus
<400> 570

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Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1               5                  10                  15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Ala Tyr Lys Leu Lys
            20                  25                  30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
        35                  40                  45
Gly Leu Leu Glu Ser Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

    50                  55                  60
Gln Pro Ser Leu Arg Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65                  70                  75                  80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Ala Val Lys Asp
                85                  90                  95
Thr Lys Glu Ala Leu Asp Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
            100                 105                 110
Lys Lys Glu Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val Ser Gln

        115                 120                 125
Asn Leu Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln Ala
    130                 135                 140
Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys
145                 150                 155                 160
Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu Gly
                165                 170                 175
Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His

            180                 185                 190
Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala
        195                 200                 205
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Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala Pro Gly
210 215 220
Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr
225 230 235 240
Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Ala Ile Pro Val

245 250 255
Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val
260 265 270
Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys
275 280 285
Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala
290 295 300
Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu

305 310 315 320
Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly
325 330 335
Pro Gly Ala Thr Leu Glu Asp Met Met Thr Ala Cys Gln Gly Val Gly
340 345 350
Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Val
355 360 365
Thr Asn Ser Ser Ala Ile Met Met Gln Arg Gly Asn Phe Arg Asn Gln

370 375 380
Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile Ala
385 390 395 400
Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Lys
405 410 415
Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe Leu
420 425 430
Gly Arg Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu Gln

435 440 445
Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly

450 455 460

Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp Lys Glu

465 470 475 480

Leu Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Leu

485 490 495

Ser Gln

<210> 571

<211> 499

<

212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (437)..(437)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (446)..(446)

<223> Xaa can be any naturally occurring amino acid

<400> 571

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Ile Asn Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Asp Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Asn Thr Ala Ser Met Met Met Gln Arg Ser Asn Phe Lys Asn

370 375 380

Gln Gly Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Val Gly His Ile

385 390 395 400

Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys Gly

405 410 415

Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Xaa Pro Ser His Lys Gly Arg Pro Gly Xaa Phe Leu

435 440 445

Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe

450 455 460

Gly Glu Glu Ala Thr Ala Pro His Gln Lys Gln Glu Pro Ile Asp Lys

465 470 475 480

Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro

485 490 495

Ser Ser Gln

<210> 572

<211> 504

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (79)..(79)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (97)..(97)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (103)..(103)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (114)..(114)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (166)..(166)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (397)..(397)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (467)..(467)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (477)..(477)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (504)..(504)

<223> Xaa can be any naturally occurring amino acid

<400> 572

Met Gly Ala Arg Ala Ser Val Leu Ser Ala Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Arg Leu Lys
20 25 30

His Val Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Xaa Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95

Xaa Lys Glu Ala Leu Asp Xaa Val Glu Glu Glu Gln Asn Gln Ser Lys

100 105 110

Lys Xaa Ala Gln Gln Ala Ala Ala Gly Thr Gly Asn Ser Asn Gln Ala
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Xaa Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Thr Thr Ala Met Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Arg Thr Val Lys Cys Phe Asn Cys Gly Xaa Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Asn Glu Arg Gln Ala
420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn
435 440 445
Phe Pro Gln Ser Arg Thr Glu Pro Gln Ser Arg Leu Glu Pro Thr Ala
450 455 460
Pro Pro Xaa Glu Ser Phe Arg Phe Gly Glu Glu Ala Xaa Ala Pro Ser
465 470 475 480
Gln Lys Gln Glu Pro Ile Asp Lys Asp Leu Tyr Pro Leu Ala Ser Leu
485 490 495

Lys Ser Leu Phe Gly Asn Asp Xaa
500

<210> 573
<211> 498
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (3)..(3)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (15)..(15)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (81)..(81)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (114)..(114)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (193)..(193)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (280)..(280)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (304)..(304)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (334)..(334)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (485)..(485)

<223> Xaa can be any naturally occurring amino acid

<400> 573

Met Gly Xaa Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Xaa Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Xaa Val Ala Val Leu Phe Cys Val His Arg Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Xaa Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Asn Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Xaa His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Xaa Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Val Xaa
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Xaa Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Lys

370 375 380

Asn Gln Arg Lys Met Val Lys Cys Phe Asn Cys Gly Arg Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Glu Glu Thr Thr Thr Pro Ser Gln Lys Pro Glu Leu Ile Glu Lys Glu

465 470 475 480

Lys Tyr Pro Leu Xaa Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser

485 490 495

Ser Gln

<210> 574

<211> 513

<212> PRT

<213> Human immunodeficiency virus

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<400> 574

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Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Xaa Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Xaa Ile Glu Glu Glu Arg Asn Lys Ser Lys

100 105 110

Lys Gln Ala Gln Gln Gln Gln Thr Gln Gln Ala Ala Ala Asp Thr Gly

115 120 125

Asn Ser Ser Lys Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln

130 135 140

Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp

145 150 155 160

Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Xaa Val Ile Pro Met

165 170 175

Phe Ala Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met

180 185 190

Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu

195 200 205

Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val Pro

210 215 220

Ala Gly Pro Val Ala Pro Gly Gln Met Arg Asp Pro Arg Gly Ser Asp

225 230 235 240

Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr

245 250 255

Ser Asn Pro Pro Ile Gln Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile

260 265 270

Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu

275 280 285

Asp Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg

290 295 300

Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn

305 310 315 320

Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys

325 330 335

Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met

340 345 350

Thr Ala Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu

355 360 365

Ala Glu Ala Met Ser Gln Ala Xaa Ser Ala Ala Xaa Met Met Gln Arg

370 375 380

Gly Asn Phe Arg Asn Gln Arg Xaa Ile Val Lys Cys Phe Asn Cys Gly
385 390 395 400
Lys Glu Gly His Ile Ala Arg Asn Cys Lys Ala Pro Arg Lys Lys Gly
405 410 415
Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Asn Asn

420 425 430
Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly
435 440 445
Arg Pro Gly Asn Phe Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Ser
450 455 460
Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu
465 470 475 480
Glu Ile Ala Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp Lys Gly Leu

485 490 495
Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Leu Ser
500 505 510
Gln

<210> 575
<211> 500
<212> PRT
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20 25 30

His Ile Val Trp Ala Ser Arg Xaa Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Ile
50 55 60

Gln Pro Ser Xaa Gln Thr Gly Ser Glu Glu Ile Lys Xaa Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Asn Ile Glu Ile Arg Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Ser Ser Lys Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Val His Pro Val Gln Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Thr Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Xaa His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Xaa Thr Asn Pro Xaa Asn Ile Met Met Gln Arg Gly Asn Phe Lys
370 375 380

Asn Gln Arg Lys Ala Val Lys Xaa Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Ile Xaa Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly Xaa Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460

Phe Gly Glu Glu Ala Thr Xaa Pro Ser Gln Lys Gln Glu Ser Ile Asp
465 470 475 480

Lys Asp Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
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<210> 576

<211> 504

<212> PRT

<213> Human immunodeficiency virus

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid

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<222> (430)..(430)

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<223> Xaa can be any naturally occurring amino acid

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<223> Xaa can be any naturally occurring amino acid
<400> 576

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Lys Leu Asp Ala Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Xaa Lys Xaa Tyr Gln Leu Lys
20 25 30
His Leu Val Trp Ala Ser Arg Glu Leu Glu Xaa Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Xaa Glu Gly Cys Arg Gln Ile Leu Gly Xaa Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Xaa Ala Gln Gln Ala Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser
115 120 125
Ser Gln Val Ser Gln Asn Phe Pro Ile Xaa Gln Asn Met Gln Gly Gln
130 135 140
Met Val His Gln Pro Leu Thr Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160
Val Val Glu Xaa Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser
165 170 175
Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn

180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile

195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly

210 215 220

Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala

225 230 235 240

Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn

245 250 255

Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly

260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile

275 280 285

Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr

290 295 300

Lys Thr Leu Arg Xaa Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met

305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Xaa Asn Pro Asp Cys Lys Thr Ile

325 330 335

Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala

340 345 350

Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Xaa Glu

355 360 365

Ala Met Ser Gln Ala Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly

370 375 380

Asn Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys

385 390 395 400

Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys

405 410 415

Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Xaa Glu Arg

420 425 430

Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro

435 440 445

Gly Asn Phe Xaa Gln Xaa Arg Xaa Glu Pro Ser Ala Pro Pro Glu Glu

450 455 460

Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu

465 470 475 480

Pro Thr Asp Lys Gly Met Tyr Pro Pro Leu Ala Ser Leu Arg Ser Leu

485 490 495

Phe Gly Asn Asp Pro Ser Ser Gln

500

<210> 577

<211> 500

<212> PRT

<213> Human immunodeficiency virus

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<400> 577

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Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Xaa Tyr Lys Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Val Glu Arg Phe Leu Ile Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

His Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Asn Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Ser Gly Ser Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Met His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Xaa

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Xaa Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Gly Ser Ala Thr Val Met Met Gln Xaa Gly Arg Phe Arg

370 375 380

Asp Gln Xaa Arg Xaa Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Xaa Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Leu Lys Asp
465 470 475 480
Gln Glu Met Tyr Pro Leu Thr Ser Leu Xaa Ser Leu Phe Gly Ser Asp
485 490 495
Pro Leu Ser Gln
500

<210> 578
<211> 505
<212> PRT
<213> Human immunodeficiency virus
<400
> 578

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Ala Glu Leu Asp Arg Trp
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Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Asn Tyr Gln Leu Lys
20 25 30
His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Ser Leu Leu Glu Thr Gly Ala Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Ala Glu Lys Asn Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ala

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Leu Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro Pro Val

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Ile Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Gly Thr Pro Asp Val Lys Gln Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Ser Ile Leu Lys Ala

325 330 335

Met Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Thr Asn Ile Met Met Gln Arg Gly Asn Phe Lys

370 375 380

Asn Gln Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Ser Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Asn Arg Thr Glu Ser Thr Ala Ser Val Glu Pro Thr Ala Pro
450 455 460
Pro Ala Glu Ser Phe Met Phe Gly Glu Glu Thr Thr Pro Pro Gln Lys
465 470 475 480
Gln Glu Pro Arg Asp Lys Glu Leu Tyr Pro Ser Thr Ala Leu Arg Ser
485 490 495
Leu Phe Gly Asn Asp Pro Leu Ser Gln
500 505

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<212> PRT

<213> Human immunodeficiency virus
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<400> 579

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
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Glu Lys Ile Arg Leu Arg Pro Gly Gly Asn Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Xaa Ala Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Val Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Pro Ala Ala Ala Asp Thr Gly Asn Asn Xaa Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Xaa Gln Gly Gln Met Val His

130 135 140

Gln Ser Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Xaa

145 150 155 160

Glu Xaa Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Xaa Pro Val Ser Ile Xaa Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Xaa Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365
Gln Val Thr Ser Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ile Val Xaa Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Xaa Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala Asn

420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Gly Thr Thr Asp
465 470 475 480
Gln Glu Xaa Tyr Pro Leu Val Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495
Pro Ser Ser Xaa
500

<210> 580
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Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Ala Leu Asp Lys Trp
1               5                  10                  15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Gln Phe Lys
            20                  25                  30
His Ile Ile Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
        35                  40                  45
Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
    50                  55                  60
Gln Pro Ser Leu Gln Thr Gly Thr Glu Glu Leu Arg Ser Leu Tyr Asn
65                  70                  75                  80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
                85                  90                  95
Thr Lys Glu Ala Ile Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
            100                 105                 110
Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser
        115                 120                 125
Ser Thr Gly Asn Asn Ser Lys Val Ser Gln Asn Tyr Pro Ile Val Gln
    130                 135                 140

Asn Leu Gln Gly Gln Met Val His Gln Pro Ile Ser Pro Arg Thr Leu
145                 150                 155                 160
Asn Ala Trp Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val
                165                 170                 175
Ile Pro Met Phe Thr Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu
            180                 185                 190
Asn Thr Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met
        195                 200                 205

Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His
    210                 215                 220
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Pro Val Gln Ala Gly Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg
225 230 235 240
Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly
245 250 255
Trp Met Thr Ser Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg
260 265 270

Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr
275 280 285
Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr
290 295 300
Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu
305 310 315 320
Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro
325 330 335

Asp Cys Arg Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu
340 345 350
Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala
355 360 365
Arg Val Leu Ala Glu Ala Met Ser Gln Val Thr Asn Ser Asn Thr Val
370 375 380
Met Met Gln Xaa Gly Asn Phe Lys Asn Gln Arg Lys Thr Val Lys Cys
385 390 395 400

Phe Asn Cys Gly Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro
405 410 415
Arg Lys Arg Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys
420 425 430
Asp Cys Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser
435 440 445
His Lys Gly Arg Pro Gly Asn Phe Leu Gln Ser Xaa Pro Glu Pro Ser
450 455 460

Ala Pro Pro Ala Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro

465 470 475 480

Pro Gln Lys Gln Glu Pro Met Asp Lys Glu Leu Tyr Pro Leu Ala Ser

485 490 495

Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505

<210> 581

<211> 505

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (152)..(152)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (178)..(178)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (193)..(193)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (223)..(223)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (228)..(228)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (370)..(370)

<223> Xaa can be any naturally occurring amino acid

<400> 581

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Arg Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Val Ala Asp Thr Gly Asn Ser Arg Gln Gly

115 120 125

Asn Asn Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln

130 135 140

Gly Gln Met Val His Gln Pro Xaa Thr Pro Arg Thr Leu Asn Ala Trp

145 150 155 160

Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met

165 170 175

Phe Xaa Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met

180 185 190

Xaa Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu

195 200 205

Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Xaa His

210 215 220

Ala Gly Pro Xaa Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp

225 230 235 240

Ile Ala Gly Thr Thr Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr

245 250 255

Ser Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile

260 265 270

Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu

275 280 285

Asp Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg
290 295 300
Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn
305 310 315 320

Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys
325 330 335
Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met
340 345 350
Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu
355 360 365
Ala Xaa Ala Met Ser Gln Met Thr Asn Ser Ala Thr Val Met Met Gln
370 375 380

Arg Gly Asn Phe Arg Asn Gln Arg Arg Thr Ile Lys Cys Phe Asn Cys
385 390 395 400
Gly Lys Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys
405 410 415
Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr
420 425 430
Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly
435 440 445

Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro
450 455 460
Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Ala Thr Pro Ala Gln Lys
465 470 475 480
Gln Glu Pro Ile Asn Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser
485 490 495
Leu Phe Gly Asn Asp His Ser Ser Gln
500 505

<210> 582
<211> 503
<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (34)..(34)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (44)..(44)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (55)..(55)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (82)..(82)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (95)..(95)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (102)..(102)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (104)..(104)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (163)..(163)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (210)..(210)

<223> Xaa can be any naturally occurring amino acid

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<222> (225)..(225)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (232)..(232)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (242)..(242)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (297)..(297)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (306)..(306)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (334)..(334)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (374)..(374)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (500)..(500)

<223> Xaa can be any naturally occurring amino acid

<400> 582

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Xaa Val Trp Ala Ser Arg Glu Leu Glu Arg Xaa Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Thr Xaa Gly Cys Arg Arg Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Xaa Ala Thr Leu Tyr Cys Val His Ala Lys Ile Glu Val Xaa Asp
85 90 95

Thr Lys Glu Ala Leu Xaa Lys Xaa Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Arg Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser Ser

115 120 125

Lys Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met

130 135 140

Val His Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Ile Glu Xaa Lys Ala Phe Asn Pro Glu Val Ile Pro Met Phe Ala Ala

165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn

195 200 205

Glu Xaa Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro

210 215 220

Xaa Ala Pro Gly Gln Met Arg Xaa Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Xaa Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro

245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Met Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Xaa Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Xaa Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Xaa Ile Leu

325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Val Thr Xaa Pro Thr Thr Ile Met Met Gln Lys Gly Asn

370 375 380

Phe Arg Ser Gln Lys Lys Thr Val Lys Cys Phe Asn Cys Gly Arg Glu

385 390 395 400

Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Gln Asn Lys Gly Arg Pro

435 440 445

Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Ala Glu

450 455 460

Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu

465 470 475 480

Pro Ile Asp Lys Glu Met Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe

485 490 495

Gly Asn Asp Xaa Ser Ser Gln

500

<210> 583

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (132)..(132)

<223> Xaa can be any naturally occurring amino acid

<400> 583

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Arg Val Gln Gln Ala Ala Ala Asp Thr Gly Gln Ser Ser Gln Val

115 120 125

Ser Gln Asn Xaa Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Asp Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Thr Asn Ala Ala Asn Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Lys Lys Ser Val Arg Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Leu Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Lys Thr Thr Ala Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Met Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 584

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 584

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Gly Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Ser Cys Ser Gln Ala
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Thr

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Ser Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro Glu Glu

450 455 460

Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Arg Gln Glu

465 470 475 480

Met Thr Asp Lys Glu Lys Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe

485 490 495

Gly Asn Asp Pro

500

<210> 585

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<400> 585

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Ala Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Gly Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His

130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ala

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Val His Pro Val Gln Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Pro Val Asn Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Ala Thr Ser Gln Lys Gln Asp Pro Ile Asp Lys

465 470 475 480

Glu Met Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro

485 490 495

Ser Ser Gln

<210> 586

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 586

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Asp Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

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Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
            100                 105                 110
Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser Ser
        115                 120                 125
Gln Val Ser Arg Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met
    130                 135                 140
Val His Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145                 150                 155                 160
Val Glu Glu Lys Asn Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala
                165                 170                 175
Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
            180                 185                 190
Ile Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
        195                 200                 205
Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Ala Gln Ala Gly Pro

    210                 215                 220
Ile Ala Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225                 230                 235                 240
Thr Thr Ser Asn Leu Gln Glu Gln Ile Thr Trp Met Thr Asn Asn Pro
                245                 250                 255
Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu
            260                 265                 270
Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys

        275                 280                 285
Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
    290                 295                 300
Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr
305                 310                 315                 320
Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu
                325                 330                 335
Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys
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340 345 350

Gln Gly Val Gly Gly Pro Ala His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Val Thr Asn Ser Thr Ala Ile Met Met Gln Lys Gly Asn

370 375 380

Phe Arg Asn Gln Arg Arg Ser Val Lys Cys Phe Asn Cys Gly Lys Glu

385 390 395 400

Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser

450 455 460

Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Asp Pro

465 470 475 480

Lys Asp Lys Asp Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln

500

<210> 587

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (445)..(445)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (454)..(454)

<223> Xaa can be any naturally occurring amino acid

<400> 587

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Arg Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Gly Leu Thr Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Ser Arg Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Pro Thr Val Ala Asp Ala Gly Asn Asn Ser Asn Gln
115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val
130 135 140
His Gln Pro Met Thr Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val
145 150 155 160
Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu
165 170 175
Ala Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190

Gly Gly His Gln Ala Ala Met Gln Ile Leu Lys Glu Thr Ile Asn Glu
195 200 205
Glu Ala Ala Asp Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile
210 215 220
Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
225 230 235 240
Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro

245 250 255

Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn
260 265 270
Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln
275 280 285
Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr
290 295 300
Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu
305 310 315 320

Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys
325 330 335
Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln
340 345 350
Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met
355 360 365
Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe
370 375 380

Gly Asn Gln Arg Arg Thr Val Lys Cys Phe Asn Cys Gly Lys Val Gly
385 390 395 400
His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys
405 410 415
Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala
420 425 430
Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Xaa Pro Gly Asn
435 440 445

Phe Leu Gln Ser Arg Xaa Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe
450 455 460
Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile
465 470 475 480
Asp Arg Glu Gly Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Asn
485 490 495

Asp Pro Leu Ser Gln
500

<210> 588

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 588

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Asn Lys Arg Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Gly Asp Gly Cys Lys Gln Ile Ile Glu Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Gln Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Lys Ala Ala Ala Ala Asp Thr Gly Asn Ser Ser
115 120 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met
130 135 140

Val His Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala
165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205
Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro
210 215 220
Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240
Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro
245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu
260 265 270
Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys
275 280 285
Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
290 295 300
Thr Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr
305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335
Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Asp Met Met Thr Ala Cys
340 345 350
Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365
Met Ser Gln Leu Thr Asn Ser Thr Ala Ile Met Met Gln Arg Gly Asn
370 375 380

Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400
Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp
405 410 415
Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln
420 425 430
Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser
450 455 460
Phe Arg Phe Gly Glu Glu Thr Thr Ala Pro Pro Gln Lys Gln Asp Gln
465 470 475 480
Ile Asp Lys Glu Leu Tyr Pro Ser Ala Ser Leu Lys Ser Leu Phe Gly
485 490 495
Asn Asp Pro Ser Ser Gln
500

<210> 589
<211> 499
<212> PRT
<213> Human immunodeficiency virus

<220><221> misc_feature
<222> (357)..(357)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (467)..(467)
<223> Xaa can be any naturally occurring amino acid
<400> 589
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45
Gly Leu Leu Glu Thr Ala Asp Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80
Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Asn Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Xaa His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Val Met Met Gln Lys Gly Asn Phe Lys

370 375 380

Gly Gln Arg Arg Ser Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg

450 455 460

Phe Gly Xaa Glu Thr Thr Pro Ser Gln Lys Pro Glu Gly Ile Asp Lys

465 470 475 480

Glu Met Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro

485 490 495

Ser Ser Gln

<210> 590

<211> 496

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (459)..(459)

<223> Xaa can be any naturally occurring amino acid

<400> 590

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Arg Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Gly Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Asn Ser Thr Thr Val Met Met Gln Arg Gly Asn Phe Lys Asn
370 375 380

Gln Arg Arg Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile
385 390 395 400

Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly
405 410 415

Gln Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe
420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu
435 440 445

Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Xaa Glu Ser Phe Arg Phe
450 455 460

Gly Glu Gly Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Arg Asp Lys
465 470 475 480

Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Ser Asp Pro
485 490 495

<210> 591

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (26)..(26)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (197)..(197)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (282)..(282)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (409)..(409)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (467)..(467)

<223> Xaa can be any naturally occurring amino acid

<400> 591

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Xaa Lys Lys Tyr Arg Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Ile Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Gln Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Xaa Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Thr Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Xaa Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ala His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Gly Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Gly

370 375 380

Asn Gln Lys Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Ile Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Xaa Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Ile Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Gly

450 455 460

Phe Gly Xaa Glu Ile Thr Thr His Ser Gln Lys Gln Glu Ser Ile Asp

465 470 475 480

Lys Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln

500

<210> 592

<211> 497

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (469)..(469)

<223> Xaa can be any naturally occurring amino acid

<400> 592

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Leu Glu Gly Cys Arg Gln Ile Leu Gly Gln Ile
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Gly Ile Asp Ile Lys Asp

85 90 95
Thr Lys Glu Ala Leu Asp Arg Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Gln Ala Ala Ala Gly Pro Gly Asn Asn Ser Gln Val Ser Gln Asn
115 120 125
Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His Gln Ala Ile
130 135 140
Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys Ala

145 150 155 160
Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu Ser Glu Gly Ala
165 170 175
Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His Gln
180 185 190
Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu
195 200 205
Trp Asp Arg Leu His Pro Val His Ala Gly Pro Thr Ala Pro Gly Gln

210 215 220
Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu
225 230 235 240
Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile Gln Val Gly
245 250 255
Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg
260 265 270
Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly Pro Lys Glu

275 280 285
Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu

290 295 300

Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val

305 310 315 320

Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro

325 330 335

Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly

340 345 350

Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Val Thr

355 360 365

Gly Thr Asn Thr Ile Met Met Gln Arg Gly Asn Phe Arg Asn Gln Arg

370 375 380

Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile Ala Lys

385 390 395 400

Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Lys Glu

405 410 415

Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe Leu Gly

420 425 430

Lys Phe Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu Gln Ser

435 440 445

Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu

450 455 460

Glu Thr Pro Thr Xaa Ser Gln Lys Gln Asp Gln Ile Asp Lys Glu Leu

465 470 475 480

Tyr Pro Ser Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Leu Leu

485 490 495

Gln

<210> 593

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 593

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Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Arg Trp
1               5                  10                  15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
            20                  25                  30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
        35                  40                  45
Ala Leu Met Glu Ser Ala Glu Gly Cys Lys Gln Ile Leu Ala Gln Leu
    50                  55                  60
Gln Pro Ser Ile Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65                  70                  75                  80
Ala Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp
                85                  90                  95

Thr Lys Glu Ala Leu Asp Lys Ile Gln Glu Glu Gln Asn Lys Ser Lys
            100                 105                 110
Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Ala Gly Asn Ser Ser
        115                 120                 125
Gln Ala Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
    130                 135                 140
Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145                 150                 155                 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala
                165                 170                 175
Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Ser
            180                 185                 190
Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
        195                 200                 205
Glu Glu Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro
    210                 215                 220

Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225                 230                 235                 240
Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro
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245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Asp Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Ile Thr Asn Asn Thr Ala Asn Ile Met Met Gln Lys Gly

370 375 380

Asn Phe Arg Ser Gln Arg Lys Ile Lys Cys Phe Asn Cys Gly Arg Glu

385 390 395 400

Gly His Ile Ala Lys His Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Asn Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser

450 455 460

Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Gln

465 470 475 480

Ile Asn Lys Glu Leu Tyr Pro Ser Val Ser Leu Lys Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln

500

<210> 594

<211> 504

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (97)..(97)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (468)..(468)

<223> Xaa can be any naturally occurring amino acid

<400> 594

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Arg Lys Ile Glu Val Lys Asp

85 90 95

Xaa Lys Glu Ala Leu Asp Met Val Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser Ser

115 120 125

Ser Lys Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln

130 135 140

Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys

145 150 155 160

Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser

165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn

180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile

195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly

210 215 220

Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala

225 230 235 240

Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn

245 250 255

Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly

260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile

275 280 285

Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr

290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met

305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile

325 330 335

Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala

340 345 350

Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu

355 360 365

Ala Met Ser Gln Val Thr His Pro Ala Thr Ile Met Met Gln Arg Gly

370 375 380

Asn Phe Arg Asn Gln Arg Lys Ile Ile Lys Cys Phe Asn Cys Gly Lys

385 390 395 400

Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys

405 410 415

Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg

420 425 430

Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Gly Arg

435 440 445

Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala

450 455 460

Glu Ser Phe Xaa Phe Gly Glu Glu Thr Ala Thr Pro Pro Pro Lys Gln

465 470 475 480

Glu Pro Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu

485 490 495

Phe Gly Asn Asp Pro Leu Ser Gln

500

<210> 595

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (95)..(95)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (138)..(138)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (162)..(162)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (389)..(389)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (451)..(451)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (455)..(455)

<223> Xaa can be any naturally occurring amino acid

<400> 595

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Ser Ser Leu Glu Thr Gly Ser Glu Glu Ile Lys Ser Leu Phe Asn
65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Xaa Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Gln Ala Gln Lys Ala Ala Ala Asp Thr Gly Ser Lys Asn Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Xaa Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Xaa Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Asn Val Met Met Gln Arg Gly Asn Phe Lys

370 375 380

Asn Gln Arg Arg Xaa Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Xaa Arg Pro Glu Xaa Ser Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Glu Pro Arg Asp
465 470 475 480
Lys Glu Leu Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Ser Asp
485 490 495
Pro Ser Leu Gln
500

<210> 596

<211> 500
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (90)..(90)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (268)..(268)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (302)..(302)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (322)..(322)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (338)..(338)

<223> Xaa can be any naturally occurring amino acid
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<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (418)..(418)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (473)..(473)

<223> Xaa can be any naturally occurring amino acid

<400> 596

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Gln Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Asp Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Thr Ile Tyr Cys Val His Xaa Lys Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Glu Gln Gln Ala Ala Ala Gly Thr Gly Asn Ile Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Xaa Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Xaa Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Xaa Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Xaa Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Xaa His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Thr Asn Ile Met Met Gln Arg Gly Asn Phe Lys

370 375 380

Asn Gln Arg Lys Ala Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Xaa Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Val Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Asp Glu Thr Ala Thr Pro Xaa Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Met Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 597

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (183)..(183)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222

> (228)..(228)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (275)..(275)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (392)..(392)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (395)..(395)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (416)..(416)

<223> Xaa can be any naturally occurring amino acid

<400> 597

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Gly Asp Gly Cys Arg Lys Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

Thr Arg Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys

100 105 110

Lys Lys Ala Gln Gln Ala Thr Ala Asp Thr Gly Asn Ser Asn Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Xaa Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Xaa Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Thr Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Xaa Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Ala Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Ser Val Lys Xaa Phe Asn Xaa Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Xaa

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Gly

450 455 460

Phe Gly Glu Glu Ile Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Val Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

His Ser Ser

<210> 598

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (46)..(46)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (64)..(64)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (77)..(77)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (79)..(79)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (88)..(88)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (109)..(109)

<223> Xaa can be any naturally occurring amino acid

<

220><221> misc_feature

<222> (111)..(111)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (126)..(126)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (157)..(157)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (162)..(162)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (168)..(168)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (269)..(269)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (312)..(312)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (315)..(315)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (406)..(406)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (411)..(411)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (478)..(478)

<223> Xaa can be any naturally occurring amino acid

<400> 598

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Xaa Asn Pro
35 40 45

Gly Leu Leu Glu Thr Thr Glu Gly Cys Arg Gln Ile Leu Gly Gln Xaa
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Xaa Leu Xaa Asn
65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Xaa His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Xaa Lys Xaa Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Xaa Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Xaa Val Ile Glu
145 150 155 160
Glu Xaa Ala Phe Ser Pro Glu Xaa Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Pro Gln Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Ile Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Thr Trp Met Thr Ser Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Xaa Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Thr Gln Xaa Val Lys Xaa Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

His Met Thr Asn Ala Asn Ala Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Xaa Ala Pro Arg Lys Xaa Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Ala Pro Pro Ser Gln Lys Gln Glu Xaa Ile Lys
465 470 475 480
Glu Glu Met Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 599
<211> 502
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
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<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (119)..(119)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
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<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (165)..(165)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (221)..(221)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (225)..(225)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (245)..(245)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (257)..(257)

<223> Xaa can be any naturally occurring amino acid

<400> 599

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Xaa Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Ile Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Xaa Ala Ala Ala Asp Thr Gly Asn Ser Ser

115 120 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met

130 135 140

Val His Gln Pro Xaa Thr Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Val Glu Glu Lys Xaa Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala

165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn

195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val Xaa Ala Gly Pro

210 215 220

Xaa Ala Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Asn Xaa Gln Glu Gln Val Thr Trp Met Thr Ser Asn Pro

245 250 255

Xaa Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Arg Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Ser Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Met Thr Ala Gln Thr Asn Ile Met Met Gln Arg Gly Asn
370 375 380
Phe Gly Asn Gln Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Lys Thr
385 390 395 400

Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Arg Lys Gly Cys Trp
405 410 415
Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln
420 425 430
Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly
435 440 445
Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser
450 455 460

Phe Arg Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Glu Thr
465 470 475 480
Ile Asp Lys Glu Met Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly
485 490 495
Asn Asp Pro Ser Ser Gln
500

<210> 600
<211> 502
<212> PRT
<213> Human immunodeficiency virus
<400> 600

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Gly Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Asn Ser
115 120 125
Pro Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140

Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160
Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala
165 170 175
Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
180 185 190
Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro
210 215 220
Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240
Thr Thr Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro
245 250 255
Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu
260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys
275 280 285
Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
290 295 300
Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr
305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350
Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365
Met Ser Gln Val Thr Asn Asn Pro Val Ile Met Met Gln Arg Gly Asn
370 375 380
Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400

Gly His Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp
405 410 415
Lys Cys Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln
420 425 430
Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly
435 440 445
Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser
450 455 460

Phe Arg Phe Gly Glu Glu Thr Ala Thr Pro Pro Gln Lys Gln Glu Pro
465 470 475 480
Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly
485 490 495
Asn Asp Pro Ser Ser Gln
500

<210> 601
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
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<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (46)..(46)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (51)..(51)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (163)..(163)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (197)..(197)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (203)..(203)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature

<222> (384)..(384)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (409)..(409)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (480)..(480)
<223> Xaa can be any naturally occurring amino acid
<400> 601
Met Gly Ala Arg Ala Ser Val Leu Ser Ala Gly Glu Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Xaa Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Xaa Asn Pro
35 40 45
Gly Leu Xaa Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Ser Lys Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Arg Ser Lys
100 105 110

Lys Gln Thr Gln Gln Val Ala Ala Gly Thr Gly Asn Ser Ser Gln Ala
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Xaa Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Xaa Met Gln Met Leu Lys Xaa Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Ala Gln Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Ala Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile
245 250 255

Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Cys Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Ala Thr Asn Pro Ala Asn Ile Met Met Gln Arg Gly Asn Phe Xaa
370 375 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Ala Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Xaa Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Asn Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Ser
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Arg Gln Glu Pro Ile Xaa
465 470 475 480

Lys Glu Met Tyr Pro Leu Thr Ala Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln
500

<210> 602
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<400> 602
Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gln Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Thr Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Arg Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Arg Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His
130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Pro Ala
210 215 220

Pro Gly Gln Leu Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Ser Tyr Lys
370 375 380
Asn Gln Arg Lys Ala Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Arg Gln Glu Gln Lys Asp
465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln

500

<210> 603

<211> 495

<212> PRT

<213> Human immunodeficiency virus

<400> 603

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Lys Lys Ala Gln Gln
100 105 110

Ala Ala Ala Ala Thr Gly Thr Ser Ser Gln Val Ser Gln Asn Tyr Pro
115 120 125

Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln Ala Ile Ser Pro
130 135 140

Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys Ala Phe Ser
145 150 155 160

Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro
165 170 175

Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His Gln Ala Ala
180 185 190

Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp
195 200 205

Arg Leu His Pro Val His Ala Gly Pro Val Ala Pro Gly Gln Met Arg
210 215 220

Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu
225 230 235 240
Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile Pro Val Gly Glu Ile
245 250 255
Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg Met Tyr
260 265 270
Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe
275 280 285

Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala
290 295 300
Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn
305 310 315 320
Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro Gly Ala
325 330 335
Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro Gly
340 345 350

His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Met Thr Asn Ser
355 360 365
Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg Asn Gln Arg Lys Pro
370 375 380
Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile Ala Lys Asn Cys
385 390 395 400
Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Lys Glu Gly His
405 410 415

Gln Met Lys Asp Cys Asn Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile
420 425 430
Trp Pro Ser Gln Lys Gly Arg Pro Gly Asn Phe Pro Gln Ser Arg Thr
435 440 445
Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg Phe Gly Glu Glu Thr

450 455 460

Thr Ala Pro Leu Gln Lys Gln Glu Pro Ile Asp Lys Glu Leu Tyr Pro
465 470 475 480

Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Leu Ser Gln
485 490 495

<210> 604

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (178)..(178)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (258)..(258)

<223> Xaa can be any naturally occurring amino acid

<400> 604

Met Gly Ala Arg Ala Ser Val Leu Ser Ala Gly Glu Leu Asp Lys Leu
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Pro Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Xaa Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile
245 250 255
Pro Xaa Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Met Thr Asn Pro Ala Ala Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Gln Glu Gly His Gln Met Lys Asp Cys Ile Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Ala Pro Pro Gln Lys Gln Glu Gln Ile Asp

465 470 475 480

Lys Asp Leu Tyr Pro Met Ala Ser Leu Lys Ser Leu Phe Gly Ser Asp

485 490 495

Pro Ser Ser Gln

500

<210> 605

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<400> 605

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Lys Gln Leu

50 55 60

Gln Pro Ser Ile Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Asn
115 120 125
Gln Ser Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140

Val His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160
Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala
165 170 175
Leu Ser Glu Gly Ala Thr Pro Thr Asp Leu Asn Ile Met Leu Asn Thr
180 185 190
Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro
210 215 220
Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240
Thr Thr Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro
245 250 255
Pro Ile Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu
260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg
275 280 285
Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
290 295 300
Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr
305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335

Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350
Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365
Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn
370 375 380
Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400

Gly His Val Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp
405 410 415
Lys Cys Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln
420 425 430
Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly
435 440 445
Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser
450 455 460

Phe Arg Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Arg Gln Glu Pro
465 470 475 480
Ile Asp Lys Glu Lys Glu Met Tyr Pro Leu Ala Ser Leu Lys Ser Leu
485 490 495
Phe Gly Asn Asp Pro
500

<210> 606
<211> 503
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (17)..(17)
<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (49)..(49)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (58)..(58)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (83)..(83)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (91)..(91)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (139)..(139)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

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222> (144)..(144)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (162)..(162)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (260)..(260)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (269)..(269)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (327)..(327)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (337)..(337)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (382)..(382)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (407)..(407)

<223> Xaa can be any naturally occurring amino acid

<400> 606

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Arg Trp
1 5 10 15

Xaa Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Xaa Leu Met Glu Thr Ser Glu Gly Cys Xaa Gln Ile Leu Gly Gln Leu
50 55 60

His Pro Ser Ile Gln Thr Gly Ser Glu Glu Ile Lys Ser Leu Tyr Asn
65 70 75 80

Thr Ile Xaa Thr Leu Tyr Cys Val His Gln Xaa Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys
100 105 110

Lys Gln Val Gln Gln Ala Ala Ala Ala Thr Gly Ser Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Xaa Gly Gln Met Val Xaa
130 135 140

Gln Ser Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Xaa Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Xaa Ile Tyr Lys Arg Trp Ile Ile Met Xaa Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Gly Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Xaa Pro Asp Cys Lys Ile Ile Leu Lys Gly
325 330 335
Xaa Gly Ala Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Pro Ala Thr Ile Met Met Gln Arg Gly Xaa Phe Arg
370 375 380
Pro Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Xaa Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Ala Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Arg Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Pro Thr Ala Pro

450 455 460

Pro Glu Glu Ser Phe Arg Phe Gly Glu Lys Thr Thr Thr Pro Ser Gln

465 470 475 480

Lys Gln Glu Gln Ile Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu Lys

485 490 495

Ser Leu Phe Gly Ser Asp Pro

500

<210> 607

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (251)..(251)

<223> Xaa can be any naturally occurring amino acid

<400> 607

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Met Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Lys Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Ile Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Arg Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Ile His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Asn Trp Met Xaa Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Gly Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His His Ile Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Arg Ile Trp Pro Ser Thr Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg
450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480
Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln
500

<210> 608
<211> 505
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (232)..(232)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222
> (458)..(458)
<223> Xaa can be any naturally occurring amino acid
<400> 608
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Val Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Asn Ser Asn Ser

115 120 125

Gln Val Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ala Gln

130 135 140

Gly His Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp

145 150 155 160

Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met

165 170 175

Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met

180 185 190

Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu

195 200 205

Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His

210 215 220

Ala Gly Pro Val Ala Pro Gly Xaa Met Arg Glu Pro Arg Gly Ser Asp

225 230 235 240

Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr

245 250 255

Asn Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile

260 265 270

Met Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu
275 280 285

Asp Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg
290 295 300

Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn

305 310 315 320

Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys
325 330 335

Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met
340 345 350

Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu
355 360 365

Ala Glu Ala Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln

370 375 380

Arg Gly Asn Phe Arg Asn Gln Arg Lys Met Val Lys Cys Phe Asn Cys
385 390 395 400

Gly Lys Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys
405 410 415

Gly Cys Trp Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr
420 425 430

Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly

435 440 445

Arg Pro Gly Asn Phe Leu Gln Ser Arg Xaa Glu Pro Thr Ala Pro Pro
450 455 460

Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Ala Pro Ser Gln Lys
465 470 475 480

Gln Glu Pro Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser
485 490 495

Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 609

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (22)..(22)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (30)..(30)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (44)..(44)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (63)..(63)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<

222> (160)..(160)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (165)..(165)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (198)..(198)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (217)..(217)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (219)..(219)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (293)..(293)

<223> Xaa can be any naturally occurring amino acid

<400> 609

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gly Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Xaa Pro Gly Gly Lys Lys Lys Tyr Xaa Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Xaa Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Gln Xaa Leu
50 55 60

Gln Pro Ser Leu Lys Thr Gly Ser Glu Glu Leu Thr Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Thr Gln Ala Gln Gln Ala Ala Ala Ala Asn Thr Gly Asn Ser Ser Gln
115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val
130 135 140

His Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Xaa
145 150 155 160

Glu Glu Lys Ala Xaa Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu
165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190

Gly Gly His Gln Ala Xaa Met Gln Met Leu Lys Glu Thr Ile Asn Glu
195 200 205

Glu Ala Ala Asp Trp Asp Arg Leu Xaa Pro Xaa His Ala Gly Pro Ile
210 215 220

Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Ser
225 230 235 240

Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro

245 250 255

Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln

275 280 285

Gly Pro Lys Glu Xaa Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Cys Thr Gln Glu Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys

325 330 335

Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Ser Gln Val Thr Ser Ser Thr Ile Met Met Gln Arg Gly Asn Phe Lys

370 375 380

Ser Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Leu Pro Pro Glu Glu

450 455 460

Ser Phe Arg Glu Glu Ala Thr Ala Pro Pro Gln Lys Gln Asp Pro Ile

465 470 475 480

Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Ser

485 490 495

Asp Pro Ser Ser Gln

500

<210

> 610

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (250)..(250)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (263)..(263)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (340)..(340)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (361)..(361)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (364)..(364)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (406)..(406)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (412)..(412)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (459)..(459)

<223> Xaa can be any naturally occurring amino acid

<400> 610

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Glu Gln Gln Ala Val Ala Asp Thr Gly Ser Lys Ser Gln Val
115 120 125
Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln
130 135 140

Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160
Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser
165 170 175
Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190
Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly
210 215 220
Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240
Gly Val Thr Ser Thr Leu Gln Glu Gln Xaa Gly Trp Met Thr Ser Asn
245 250 255

Pro Pro Ile Pro Val Gly Xaa Val Tyr Lys Lys Trp Ile Ile Ile Gly
260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile
275 280 285
Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300
Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met
305 310 315 320
Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Arg Thr Ile
325 330 335

Leu Lys Ala Xaa Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350
Cys Gln Gly Val Gly Gly Pro Gly Xaa Lys Ala Xaa Val Leu Ala Glu
355 360 365
Ala Met Ser Gln Ala Thr Asn Ser Ala Ala Ile Met Val Gln Arg Gly
370 375 380
Asn Tyr Lys Gly Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys
385 390 395 400

Glu Gly His Ile Ser Xaa Asn Cys Arg Ala Pro Xaa Lys Lys Gly Cys
405 410 415
Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg
420 425 430
Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro
435 440 445
Gly Asn Phe Leu Gln Asn Arg Pro Glu Pro Xaa Ala Pro Pro Glu Glu
450 455 460

Ser Phe Arg Phe Gly Glu Glu Pro Ala Thr Pro Pro Gln Lys Gln Glu
465 470 475 480
Pro Met Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe
485 490 495
Gly Asn Asp Pro Ser Ser Gln

500

<210> 611

<211> 504

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (114)..(114)

<223> Xaa can be any naturally occurring amino acid

<220><

221> misc_feature

<222> (358)..(358)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (436)..(436)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (488)..(488)

<223> Xaa can be any naturally occurring amino acid

<400> 611

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Ala Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Gln Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Xaa Ala Gln Gln Thr Ala Ala Asp Ala Ala Ala Ala Ser Ser Gln
115 120 125
Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val
130 135 140
His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val

145 150 155 160
Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu
165 170 175
Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190
Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu
195 200 205
Glu Ala Ala Glu Trp Asp Arg Met His Pro Val His Ala Gly Pro Ile

210 215 220
Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
225 230 235 240
Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro
245 250 255
Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn
260 265 270
Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln

275 280 285
Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Val
290 295 300
Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu
305 310 315 320
Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys
325 330 335
Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350
Gly Val Gly Gly Pro Xaa His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Ser Gln Val Thr Ser Ser Ala Ala Ile Met Met Gln Lys Gly Asn Phe

370 375 380

Arg Ser Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Asp Glu Arg Gln Ala

420 425 430

Asn Phe Leu Xaa Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Ser Arg Thr Glu

450 455 460

Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr

465 470 475 480

Thr Pro Ser Gln Lys Gln Glu Xaa Glu Arg Tyr Pro Leu Ala Ser Leu

485 490 495

Arg Ser Leu Phe Gly Asn Asp Pro

500

<210> 612

<211> 509

<212> PRT

<213> Human immunodeficiency virus

<400> 612

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Ser Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Lys Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160
Glu Lys Ser Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Arg Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Asn Thr Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Ser Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Arg Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Gln Ser Arg Pro Glu Pro

450 455 460

Thr Ala Pro Pro Ala Glu Ser Phe Arg Phe Gly Glu Glu Thr Ile Thr

465 470 475 480

Pro Ser Pro Lys Gln Glu Pro Ile Asp Lys Gly Leu Tyr Pro Ser Asp

485 490 495

Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Leu Ser Gln

500 505

<210> 613

<211> 497

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (143)..(143)

<223> Xaa can be any naturally occurring amino acid

<400> 613

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Ile Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

His Ser Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Asp Ile Gly Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Arg Val Glu Glu Glu Gln Asn Lys Ile Lys

100 105 110

Lys Ser Ala Gln Gln Ala Ala Asp Thr Gly Asn Ser Ser Lys Val Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Xaa His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Pro Val
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Val Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335
Leu Gly Pro Ser Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Asn Val Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Pro Gln Ser Arg Thr Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Pro

450 455 460
Glu Thr Ala Thr Pro Phe Gln Arg Gln Glu Pro Ile Asp Lys Glu Leu
465 470 475 480
Ser Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Ser Ser

485 490 495

Gln

<210> 614

<211> 504

<212> PRT

<213> Human immunodeficiency virus

<400> 614

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Ala Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Ala Ile Ala Val Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Lys Lys Ser Lys
100 105 110

Lys Thr Thr Gln Gln Ala Ala Ala Ala Ala Ala Ala Asp Thr Gly Asn
115 120 125

Ser Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly
130 135 140

Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val
145 150 155 160

Lys Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe
165 170 175

Thr Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu
180 185 190

Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr
195 200 205

Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala
210 215 220
Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile
225 230 235 240
Ala Gly Thr Thr Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Ser
245 250 255
Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu
260 265 270

Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp
275 280 285
Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe
290 295 300
Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp
305 310 315 320
Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr
325 330 335

Ile Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr
340 345 350
Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala
355 360 365
Glu Ala Met Ser Gln Val Thr Asn Pro Ala Thr Ile Met Met Gln Lys
370 375 380
Gly Asn Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly
385 390 395 400

Lys Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly
405 410 415
Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu
420 425 430
Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg

435 440 445

Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu

450 455 460

Glu Ser Leu Arg Leu Gly Gly Glu Thr Thr Thr Pro Ser Gln Arg Gln

465 470 475 480

Glu Pro Ile Asp Arg Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu

485 490 495

Phe Gly Asn Asp Pro Ser Ser Gln

500

<210> 615

<211> 512

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (447)..(447)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (478)..(478)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (484)..(484)

<223> Xaa can be any naturally occurring amino acid

<400> 615

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ser Ile Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Ala Val Ala Val Leu Tyr Cys Val His Gln Asn Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser

115 120 125

Ser Gln Ser Ser Gln Asn Tyr Pro Ile Val Gln Asn Val Gln Gly Gln

130 135 140

Met Val Tyr Gln Ser Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys

145 150 155 160

Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser

165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Ser Asp Leu Asn Leu Met Leu Asn

180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile

195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Thr His Pro Val His Ala Gly

210 215 220

Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala

225 230 235 240

Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Gly Asn

245 250 255

Pro Val Ile Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly

260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile

275 280 285

Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr

290 295 300

Lys Val Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met

305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile
325 330 335
Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350
Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu

355 360 365
Ala Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly
370 375 380
Asn Pro Arg Asn Gln Arg Lys Ile Ile Lys Cys Phe Asn Cys Gly Lys
385 390 395 400
Glu Gly His Ile Ala Arg Asn Cys Lys Ala Pro Arg Lys Lys Gly Cys
405 410 415
Trp Lys Cys Gly Arg Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg

420 425 430
Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Xaa Pro
435 440 445
Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu
450 455 460
Ser Leu Pro Thr Ala Pro Pro Val Glu Ser Phe Arg Phe Xaa Glu Glu
465 470 475 480
Thr Thr Thr Xaa Ser Gln Lys Gln Gly Pro Ile Asp Lys Glu Leu Tyr

485 490 495
Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505 510

<210> 616
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<400> 616

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Thr Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Thr Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu His Asn
65 70 75 80
Ala Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Ser Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Val Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380

Asn Gln Arg Lys Ile Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Leu Ala Arg Asn Cys Lys Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Gln Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460

Phe Gly Glu Glu Thr Ile Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp
465 470 475 480

Lys Asp Arg His Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 617

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<400> 617

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Gln Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Gly Glu Gly Cys Arg Gln Leu Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu His Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Gly Ile Glu Val Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Pro Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ser Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Thr Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Asn Thr Val Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Ala Glu Ser Phe Arg
450 455 460

Phe Gly Glu Glu Thr Thr Pro Ser Gln Lys Gln Glu Gln Ile Asp Lys
465 470 475 480

Glu Met Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro
485 490 495
Ser Ser Gln

<210> 618
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (28)..(28)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (55)..(55)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (68)..(68)
<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
<222> (161)..(161)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (267)..(267)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (295)..(295)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (385)..(385)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (388)..(388)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
<222> (460)..(460)
<223> Xaa can be any naturally occurring amino acid
<400> 618

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Gln Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Xaa Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Xaa Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ala Xaa Gln Thr Gly Thr Glu Glu Ile Arg Ser Leu Tyr Asn
65 70 75 80
Thr Val Val Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95
Thr Asn Glu Ala Leu Glu Lys Ile Lys Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Glu Thr Gln Gln Ala Ala Ala Asp Thr Gly Lys Ser Asn Gln Val
115 120 125
Ser Gln Asn Tyr Pro Val Val Gln Asn Met Gln Gly Gln Met Val His
130 135 140
Gln Pro Val Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Xaa Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ala
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Xaa Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Xaa Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Ala Thr Ser Ala Ser Ala Met Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Xaa Gln Arg Xaa Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Leu Met Lys Glu Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Xaa Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ser Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 619

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (8)..(8)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (15)..(15)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (44)..(44)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (128)..(128)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (138)..(138)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (167)..(167)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (177)..(177)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (306)..(306)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (334)..(334)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (478)..(478)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (490)..(490)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (495)..(495)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (499)..(499)

<223> Xaa can be any naturally occurring amino acid

<400> 619

Met Gly Ala Arg Ala Ser Val Xaa Ser Gly Gly Lys Leu Asp Xaa Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Gln Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Xaa Ala Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Ser Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Asn Ile Asp Val Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Gly Lys
100 105 110

Lys Asn Ala Gln Gln Ala Ala Ala Asn Thr Gly Asn Asn Ile Pro Xaa
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Xaa Gln Gly Gln Met Val His
130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Xaa Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Xaa Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Xaa Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Xaa Lys Ala
325 330 335

Leu Gly Pro Gly Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Pro Ala Thr Ile Met Leu Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Pro Glu Xaa Lys Asp

465 470 475 480

Lys Glu Met Tyr Pro Leu Ala Ser Leu Xaa Ser Leu Phe Gly Xaa Asp

485 490 495

Pro Ser Xaa Gln

500

<210> 620

<211> 498

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (64)..(64)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (73)..(73)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (90)..(90)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (95)..(95)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (118)..(118)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (460)..(460)

<223> Xaa can be any naturally occurring amino acid

<400> 620

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Lys Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Lys Gln Ile Leu Gly Gln Xaa

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Xaa Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Xaa Gln Ile Asp Val Xaa Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Xaa Ala Ala Asp Thr Arg Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Thr Ser Ile Met Met Gln Gly Gly Ser Met Arg
370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Val Gly His

385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Arg Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Ser Glu Lys Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Ala Gln Asn Arg Leu Glu Pro Thr Ala Pro Pro Xaa Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Gln Ile Asp Lys

465 470 475 480

Asp Asn Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser

485 490 495

Ser Gln

<210> 621

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (62)..(62)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (75)..(75)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (91)..(91)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (93)..(93)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (476)..(476)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (478)..(478)

<223> Xaa can be any naturally occurring amino acid

<400> 621

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Xaa Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Xaa Arg Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Xaa Ile Xaa Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Thr Ala Ala Gly Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Ile Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Arg Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Ser Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Xaa Glu Xaa Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln
500

<210> 622
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<400
> 622

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Ser Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

His Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Thr Ala Ala Asp Thr Gly Ser Asn Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255

Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Gly Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Thr Val Met Met Gln Lys Gly Asn Phe Arg
370 375 380

Ser Gln Arg Arg Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Leu Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp
465 470 475 480

Lys Glu Met Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495

Pro Leu Ser Gln
500

<210> 623

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<400

> 623

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Gly Ser Leu Tyr Asn
65 70 75 80

Thr Met Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Gly Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile
245 250 255

Pro Val Gly Asp Ile Tyr Lys Lys Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Pro Ser Thr Ile Met Ile Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Arg Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445

Pro Gln Ser Arg Thr Glu Pro Thr Ala Pro Pro Glu Glu Asn Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp Lys
465 470 475 480
Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro
485 490 495
Leu Ser Gln

<210> 624
<211> 509
<212> PRT
<213> Human immunodeficiency virus
<400> 624

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Lys Tyr Arg Leu Lys
20 25 30
His Val Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Arg Lys Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Pro Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Ala

115 120 125

Thr Pro Gly Gly Pro Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu

130 135 140

Gln Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala

145 150 155 160

Trp Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro

165 170 175

Met Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr

180 185 190

Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys

195 200 205

Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val

210 215 220

His Ala Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser

225 230 235 240

Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met

245 250 255

Thr Asn Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile

260 265 270

Ile Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile

275 280 285

Leu Asp Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp

290 295 300

Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys

305 310 315 320

Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys
325 330 335
Lys Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met
340 345 350
Met Thr Ala Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val
355 360 365
Leu Ala Glu Ala Met Ser Gln Val Asn Gln Ala Thr Ile Met Met Gln
370 375 380

Lys Gly Asn Phe Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys
385 390 395 400
Gly Lys Glu Gly His Ile Ala Arg Asn Cys Lys Ala Pro Arg Lys Arg
405 410 415
Gly Cys Trp Lys Cys Gly Lys Asp Gly His Gln Met Lys Asp Cys Thr
420 425 430
Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly
435 440 445

Arg Pro Gly Asn Phe Leu Gln Asn Arg Pro Glu Ser Arg Pro Glu Pro
450 455 460
Ser Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Ala Phe
465 470 475 480
Pro Ser Gln Lys Gln Glu Pro Ile Asp Lys Glu Leu Tyr Pro Leu Val
485 490 495
Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 625

<211> 504
<212> PRT
<213> Human immunodeficiency virus
<400> 625
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Ser Leu Val Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Arg Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Asn Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Glu

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Asn Asn Asn Ser Pro Val

115 120 125

Ser Gln Asn Phe Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Ala Val

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys

260 265 270

Val Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320
Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ser His Lys Ala Lys Ile Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Lys

370 375 380
Gly Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Val Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445
Leu Gln Asn Arg Pro Glu Ser Arg Leu Glu Pro Thr Ala Pro Pro Ala
450 455 460
Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln
465 470 475 480
Glu Gln Thr Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu
485 490 495
Phe Gly Asn Asp Pro Ser Ser Gln
500

<210> 626

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 626

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Ser Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Ile His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro His Asp Leu Asn Thr Met Leu Asn Ala Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255
Pro Val Gly Glu Val Tyr Lys Lys Trp Ile Ile Met Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Ser Pro Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380
Asn Pro Arg Lys Ser Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe

435 440 445
Leu Gln Ser Arg Leu Glu Pro Thr Ala Pro Leu Glu Glu Ser Phe Arg
450 455 460
Phe Arg Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Gln Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 627

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (12)..(12)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (67)..(67)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (223)..(223)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (292)..(292)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (326)..(326)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (442)..(442)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (447)..(447)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (452)..(452)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (467)..(467)

<223> Xaa can be any naturally occurring amino acid

<400> 627

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Xaa Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Lys Ile Leu Glu Gln Leu

50 55 60

Gln Pro Xaa Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Val Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Xaa Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Xaa Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Xaa Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

His Ile Gln Asn Ser Asn Thr Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Xaa Gly Arg Pro Gly Xaa Phe

435 440 445

Leu Gln Ser Xaa Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Ser Gly Xaa Gly Thr Thr Thr Leu Pro Gln Lys Gln Glu Pro Ile Asp
465 470 475 480
Lys Glu Gln Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495
Pro Leu Ser Gln
500

<210> 628
<211> 510
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (226)..(226)
<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
<222> (466)..(466)
<223> Xaa can be any naturally occurring amino acid
<400> 628
Met Gly Ala Arg Ala Ser Val Leu Ser Ala Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Gly Gln Ile
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Lys Glu Gln Asn Asn Ser Gln
100 105 110

Lys Lys Val Gln Gln Val Ala Ala Gly Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Pro Leu Thr Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Asp Trp Asp Arg Val His Pro Val Gln Ala Gly Pro Val Ala

210 215 220

Pro Xaa Gln Ile Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Thr Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Ser Thr Ser Ala Ile Met Met Gln Lys Gly Asn Tyr Arg
370 375 380
Ile Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Asn Arg Pro Glu Pro Ser Ala Pro Ala Glu Pro Ser Ala Pro
450 455 460
Pro Xaa Glu Ser Phe Arg Phe Gly Glu Gly Thr Thr Thr Pro Ser Arg
465 470 475 480
Gly Gln Glu Pro Thr Asp Lys Ser Gln Glu Pro Thr Asp Lys Gly Leu
485 490 495

Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Ser Asp Pro
500 505 510

<210> 629
<211> 503
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (371)..(371)
<223> Xaa can be any naturally occurring amino acid
<400> 629
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Ile Lys Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Ala Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Ala Asn Thr Gly Asn Ser Ser Gln
115 120 125
Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val
130 135 140
His Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val
145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu
165 170 175
Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190
Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu
195 200 205
Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile
210 215 220

Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
225 230 235 240
Thr Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro
245 250 255
Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn
260 265 270
Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln
275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu
305 310 315 320
Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys
325 330 335
Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln
340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met
355 360 365
Ser Gln Xaa Thr Asn Ser Ala Ser Ala Ala Ile Met Met Gln Arg Gly
370 375 380
Asn Phe Lys Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys
385 390 395 400
Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys
405 410 415

Trp Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg
420 425 430
Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro
435 440 445
Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu
450 455 460
Ser Phe Arg Phe Gly Glu Glu Thr Thr Ala Pro Ser Gln Lys Gln Glu
465 470 475 480

Thr Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe
485 490 495
Gly Asn Asp Pro Ser Ser Gln
500

<210> 630
<211> 499
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature

<222> (4)..(4)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (26)..(26)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (30)..(30)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (64)..(64)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (138)..(138)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (147)..(147)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (334)..(334)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (463)..(463)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (476)..(476)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (485)..(485)

<223> Xaa can be any naturally occurring amino acid

<400> 630

Met Gly Ala Xaa Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Xaa Lys Thr Tyr Xaa Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ala Ala Gly Cys Arg Gln Ile Leu Gly Gln Xaa
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Ile Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Arg Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Lys Glu Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Xaa Gln Gly Gln Met Val His
130 135 140
Gln Ala Xaa Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ala
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Ser Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Xaa Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Pro Thr Ile Met Met Gln Arg Gly Asn Tyr Arg Ser
370 375 380

Thr Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile
385 390 395 400

Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly
405 410 415

Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala Asn Phe
420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu
435 440 445

Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Xaa Val
450 455 460

Arg Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Xaa Thr Ile Asp Lys
465 470 475 480

Glu Leu Tyr Pro Xaa Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro
485 490 495

Ser Ser Gln

<210> 631

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (463)..(463)

<223> Xaa can be any naturally occurring amino acid

<400> 631

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Asn Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Asp Thr Gly Asn Asn Ser Gln
115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val
130 135 140

His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val

145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu
165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu

195 200 205

Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Ile

210 215 220

Ala Pro Gly Gln Leu Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr

225 230 235 240

Thr Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro

245 250 255

Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile Lys Gln

275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys

325 330 335

Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Ser Gln Val Thr Asn Asn Thr Asn Ile Met Met Gln Arg Gly Asn Phe

370 375 380

Arg Asn Pro Arg Lys Ile Ala Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Arg Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Asn Arg Thr Glu Pro Thr Ala Pro Pro Ala Glu Xaa Phe

450 455 460

Arg Phe Gly Glu Glu Thr Thr Pro Ser Gln Lys Gln Glu Gln Thr Asp

465 470 475 480

Lys Asp Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Leu Leu

500

<210> 632

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<400> 632

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile His Leu Arg Pro Gly Gly Lys Lys Arg Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Ile Asn Pro

35 40 45

Ser Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Ile Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Gln Ala Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val Ser

115 120 125

Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His Gln

130 135 140

Pro Leu Thr Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu

145 150 155 160

Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu

165 170 175

Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly

180 185 190

His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala

195 200 205

Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala Pro

210 215 220

Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser

225 230 235 240

Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro

245 250 255

Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile

260 265 270

Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly Pro

275 280 285

Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg

290 295 300

Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu

305 310 315 320

Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu

325 330 335

Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val

340 345 350

Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln

355 360 365

Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Lys Asn

370 375 380

Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile

385 390 395 400

Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys Gly

405 410 415

Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Ala Glu Ser Phe Gly Phe

450 455 460

Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp Arg

465 470 475 480

Glu Met Tyr Pro Leu Ser Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro

485 490 495

Ser Ser Gln

<210> 633

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<400> 633

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Ala Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Ile Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Asn Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ala

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Pro Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Gly Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Thr Asn Pro Asn Ile Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Asp Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Ser Glu Gln Ser Arg Leu Glu Pro Thr Ala Pro Pro

450 455 460

Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Ala Thr Pro Pro Gln

465 470 475 480

Lys Gln Glu Pro Ile Asp Lys Glu Arg Tyr Pro Leu Thr Ser Leu Arg

485 490 495

Ser Leu Phe Gly Asn Asp Pro

500

<210> 634

<211> 499

<212> PRT

<213> Human immunodeficiency virus

<400> 634

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95
Thr Lys Glu Ala Leu Glu Asn Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Pro Ala Asp Asp Thr Gly Asn Ser Ser Gln Val Ser
115 120 125
Gln Asn Tyr Pro Val Val Gln Asn Leu Gln Gly Gln Met Val His Gln
130 135 140
Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu

145 150 155 160
Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser Glu
165 170 175
Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly
180 185 190
His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala
195 200 205
Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala Pro

210 215 220
Asp Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Ile Thr Ser
225 230 235 240
Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro
245 250 255
Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile
260 265 270
Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly Pro

275 280 285

Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg

290 295 300

Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr Leu

305 310 315 320

Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu

325 330 335

Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val

340 345 350

Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln

355 360 365

Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg Asn

370 375 380

Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile

385 390 395 400

Thr Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415

Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser Lys Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg Phe

450 455 460

Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Thr Asp Lys

465 470 475 480

Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro

485 490 495

Ser Ser Gln

<210> 635

<211> 504

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (327)..(327)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (392)..(392)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (405)..(405)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (413)..(413)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (416)..(416)

<223> Xaa can be any naturally occurring amino acid

<400> 635

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Lys Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Ser Tyr Lys Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Gly Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Ala Gly Glu Asn Lys Leu Val

115 120 125

Ser Gln Asn Phe Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Xaa Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Ala Val Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ala Val Lys Xaa Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Xaa Arg Ala Pro Arg Lys Lys Gly Xaa Trp Lys Xaa

405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu
450 455 460
Glu Ser Phe Ser Phe Gly Glu Glu Thr Gly Ile Pro Ser Gln Lys Gln

465 470 475 480
Gly Thr Ile Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu
485 490 495
Phe Gly Asn Asp Pro Ser Ser Gln
500

<210> 636
<211> 498
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (45)..(45)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (103)..(103)
<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
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<223> Xaa can be any naturally occurring amino acid
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<222> (306)..(306)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (389)..(389)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (397)..(397)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (404)..(404)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (407)..(407)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (467)..(467)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (487)..(487)

<223> Xaa can be any naturally occurring amino acid

<400> 636

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Gln Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Xaa Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60

Glu Pro Ala Leu Lys Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Xaa Ile Glu Glu Glu Arg Asn Lys Ser Lys

100 105 110

Lys Lys Xaa Gln Gln Ala Ala Ala Asp Ala Gly Asn Asn Ser Ser Gln

115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val

130 135 140

His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val

145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu

165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val

180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu

195 200 205

Glu Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Val

210 215 220

Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr

225 230 235 240

Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro

245 250 255

Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln

275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Xaa Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys

325 330 335

Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Ser Gln Val Thr Asn Ala Thr Thr Ile Met Met Gln Lys Gly Asn Tyr

370 375 380

Arg Asn Gln Arg Xaa Thr Val Lys Cys Phe Asn Cys Xaa Lys Glu Gly

385 390 395 400

His Ile Ala Xaa Asn Cys Xaa Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Gln Glu Gly His Gln Met Lys Asp Cys Thr Gly Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe

450 455 460

Arg Phe Xaa Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Arg

465 470 475 480

Asp Arg Glu Leu Tyr Pro Xaa Ala Ser Leu Arg Ser Leu Phe Gly Asn

485 490 495

Asp Pro

<210> 637

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (26)..(26)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (57)..(57)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (67)..(67)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (128)..(128)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (140)..(140)
<223> Xaa can be any naturally occurring amino acid
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<222> (227)..(227)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
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<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature

<222> (423)..(423)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (427)..(427)
<223> Xaa can be any naturally occurring amino acid
<400> 637

Met Gly Ala Arg Ala Ser Val Leu Ser Ala Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Xaa Lys Lys Tyr Arg Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Xaa Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Xaa Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110
Lys Lys Ala Gln Gln Ala Val Ala Asp Thr Gly Asn Ser Asn Gln Xaa
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Xaa Gln Met Val His
130 135 140
Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser

165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala
210 215 220
Pro Gly Xaa Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Xaa Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Asp Thr
305 310 315 320
Leu Leu Ile Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr His Pro Pro Thr Ile Met Val Gln Asn Gly Lys Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Xaa Lys Asp Cys Xaa Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Arg Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Val Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Thr Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Cys Gln

500

<210> 638

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<400> 638

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys

20 25 30

His Ile Ile Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Ser Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Val Ala Ala Ala Gly Thr Gly Asn Ser Ser

115 120 125

Gln Val Ser Gln Asn Phe Pro Ile Val Gln Asn Leu Gln Gly Gln Met

130 135 140

Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala

165 170 175

Leu Ser Glu Gly Val Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn

195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro

210 215 220

Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Asn Leu Gln Glu Gln Val Ala Trp Met Thr Ser Asn Pro

245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Asp Met Met Thr Ala Cys

340 345 350

Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Ala Asn Ser Ala Ser Ile Met Met Gln Arg Gly Asn Phe

370 375 380

Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Val

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn

435 440 445

Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe

450 455 460

Arg Phe Gly Glu Glu Thr Lys Thr Pro Pro Gln Lys Gln Glu Pro Thr

465 470 475 480

Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn

485 490 495

Asp Pro Ser Ser Gln

500

<210> 639

<211> 498

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (21)..(21)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (46)..(46)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (61)..(61)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (63)..(63)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (67)..(67)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (80)..(80)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (84)..(84)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (91)..(91)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

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<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (164)..(164)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (170)..(170)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (238)..(238)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (448)..(448)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (451)..(451)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (461)..(461)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (465)..(465)

<223> Xaa can be any naturally occurring amino acid

<400> 639

Met Gly Ala Arg Ala Ser Val Leu Ser Pro Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Gly Ile Arg Xaa Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Xaa Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Gly Gly Cys Lys Gln Ile Xaa Glu Xaa Leu
50 55 60

Leu Pro Xaa Leu Gln Thr Gly Ser Glu Gly Phe Arg Ser Leu Tyr Xaa
65 70 75 80

Thr Val Ala Xaa Leu Tyr Cys Val His Lys Xaa Ile Glu Ile Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Asn Ser Lys
100 105 110

Lys Arg Ala Gln Gln Ala Ala Ala Gly Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Xaa Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Xaa Ser Pro Glu Val Ile Xaa Met Phe Thr Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Ala Gln Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Ile Arg Asp Pro Arg Gly Ser Asp Ile Ala Xaa Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Thr Trp Met Thr Ala Asn Pro Ala Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Arg Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Asn Thr Thr Ile Met Met Gln Lys Gly Asn

370 375 380

Phe Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His Leu

385 390 395 400

Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415

Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Xaa

435 440 445

Phe Leu Xaa Ser Arg Pro Glu Pro Thr Ala Pro Pro Xaa Glu Ser Phe

450 455 460

Xaa Phe Gln Glu Glu Thr Thr Thr Pro Pro Arg Lys Gln Glu Pro Ile

465 470 475 480

Asp Lys Asp Gln Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn

485 490 495

Asp Pro

<210> 640

<211> 498

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (88)..(88)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (374)..(374)

<223> Xaa can be any naturally occurring amino acid

<400> 640

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Asp Phe Arg Ser Leu Tyr Asn

65 70 75 80
Thr Ile Ala Thr Leu Tyr Cys Xaa His Gln Asn Ile Asp Ile Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Arg Ala Gln Gln Ala Ala Ala Asp Ala Gly Asn Lys Ser Gln Ile
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His

130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Ala Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Thr Xaa Thr Val Met Met Gln Lys Gly Asn Phe Lys

370 375 380

Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ile Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Ile Asp Lys Glu

465 470 475 480

Gln Cys Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Leu

485 490 495

Ser Gln

<210> 641

<211> 505

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (133)..(133)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (175)..(175)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (189)..(189)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (271)..(271)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (303)..(303)

<223> Xaa can be any naturally occurring amino acid

<400> 641

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gly Leu Asp Arg Trp
1 5 10 15

Lys Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Ser Lys Ser Lys

100 105 110

Lys Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser

115 120 125

Ser Gln Val Ser Xaa Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln

130 135 140

Met Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys

145 150 155 160

Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Xaa Thr

165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Xaa Met Leu Asn

180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile

195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly

210 215 220

Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala

225 230 235 240

Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn

245 250 255

Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Xaa Gly

260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile

275 280 285

Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Xaa Tyr

290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met

305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile

325 330 335

Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala

340 345 350

Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu
355 360 365

Ala Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly
370 375 380

Asn Phe Arg Ser His Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Lys
385 390 395 400

Glu Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys
405 410 415

Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg
420 425 430

Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro
435 440 445

Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu
450 455 460

Ser Phe Arg Ser Gly Glu Gly Thr Ala Thr Pro Ala Gln Lys Gln Glu
465 470 475 480

Leu Ile Asp Leu Asp Lys Glu Met Tyr Pro Leu Thr Ser Leu Arg Ser
485 490 495

Leu Phe Gly Asn Asp Pro Ser Ser Lys
500 505

<210> 642

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (28)..(28)

<223> Xaa can be any naturally occurring amino acid

<400> 642

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Xaa Tyr Lys Leu Lys
20 25 30

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His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
        35                  40                  45
Ala Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
    50                  55                  60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65                  70                  75                  80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
                85                  90                  95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
            100                 105                 110
Lys Arg Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Asn Gln Val
        115                 120                 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Thr His
    130                 135                 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145                 150                 155                 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
                165                 170                 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
            180                 185                 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
        195                 200                 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
    210                 215                 220
Pro Gly Gln Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225                 230                 235                 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
                245                 250                 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
            260                 265                 270
Ile Val Arg Met Tyr Ser Pro Ala Ser Ile Leu Asp Ile Lys Gln Gly
```

275 280 285

Pro Lys Glu Ser Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Gly Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Pro Ala Asn Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Arg Ile Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Gly Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Met

450 455 460

Phe Gly Glu Glu Thr Ala Ala Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Lys Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Leu Ser Gln

500

<210> 643

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220

><221> misc_feature

<222> (66)..(66)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (103)..(103)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (124)..(124)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (135)..(135)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (159)..(159)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (257)..(257)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (259)..(259)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (263)..(263)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (268)..(268)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (274)..(274)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (290)..(290)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (312)..(312)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (322)..(322)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (381)..(381)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (383)..(383)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (470)..(470)

<223> Xaa can be any naturally occurring amino acid

<400> 643

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Gln Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Xaa Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Ala Val Ala Val Leu Tyr Cys Val His Gln Asn Ile Glu Ile Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Xaa Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Xaa Ser Ser Asn Val
115 120 125

Ser Gln Asn Tyr Pro Ile Xaa Gln Asn Met Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Xaa Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255

Xaa Val Xaa Glu Ile Tyr Xaa Arg Trp Ile Ile Xaa Gly Leu Asn Lys
260 265 270

Ile Xaa Arg Met Tyr Ser Pro Ile Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Xaa Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Xaa Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Xaa Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Thr Asn Ile Met Met Gln Arg Xaa Ser Xaa Arg
370 375 380
Ser Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Arg Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Asn Lys Gly Arg Pro Gly Asn Phe
435 440 445
Pro Gln Ser Arg Leu Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Xaa Thr Pro Ser Gln Lys Gln Glu Pro Lys Asp
465 470 475 480
Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 644
<211> 501
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (326)..(326)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (363)..(363)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (371)..(371)
<223> Xaa can be any naturally occurring amino acid

<400> 644

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Ile Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Ala Ser Glu Glu Val Lys Ser Leu Asn Asn
65 70 75 80

Ala Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Arg Ala Gln Gln Ala Ala Ala Ala Thr Gly Asn Asn Ser Gln Ser
115 120 125

Ser Gln Gly Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln
130 135 140

Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160

Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser
165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile
195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Met His Pro Val His Ala Gly
210 215 220

Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240

Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn
245 250 255
Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly
260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile
275 280 285
Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300
Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met
305 310 315 320
Thr Glu Thr Leu Leu Xaa Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile
325 330 335

Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350
Cys Gln Gly Val Gly Gly Pro Gly His Lys Xaa Arg Val Leu Ala Glu
355 360 365
Ala Met Xaa His Val Thr Asn Ser Thr Asn Ile Met Met Gln Arg Gly
370 375 380
Asn Phe Arg Asn Gln Arg Lys Ala Val Lys Cys Phe Asn Cys Gly Lys
385 390 395 400

Glu Gly His Ile Ala Arg Asn Cys Lys Ala Pro Arg Lys Lys Gly Cys
405 410 415
Trp Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg
420 425 430
Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro
435 440 445
Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu
450 455 460

Ser Phe Arg Glu Glu Ala Thr Thr Pro Pro Gln Arg Ser Glu Pro Ile
465 470 475 480
Asp Lys Glu Met Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn

485 490 495

Asp Pro Ser Ser Gln

500

<210> 645

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (73)..(73)

<223> Xaa can be any naturally occurring amino acid

<400> 645

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Asp Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Xaa Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Gly Thr Gly Asn Ser Ser Gln Thr

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Asn

355 360 365

Gln Val Thr Thr Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Ala Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Gln Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 646

<211> 498

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (8)..(8)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (21)..(21)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (55)..(55)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (102)..(102)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (110)..(110)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (127)..(127)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
<222> (154)..(154)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (205)..(205)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (298)..(298)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (344)..(344)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (383)..(383)
<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
<222> (392)..(392)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (471)..(471)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (481)..(481)
<223> Xaa can be any naturally occurring amino acid
<400> 646
Met Gly Ala Arg Ala Ser Ile Xaa Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Xaa Arg Pro Gly Gly Asn Lys Lys Tyr Lys Leu Lys

20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Xaa Gly Cys Arg Gln Ile Leu Val Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95
Thr Arg Glu Ala Leu Xaa Lys Val Glu Glu Glu Gln Asn Xaa Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Ser Asn Ser Xaa Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Ala Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Xaa Trp Val Lys Val Val Glu

145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Xaa Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220
Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Xaa Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Xaa Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Gln Gln Gly Asn Tyr Xaa Asn

370 375 380

Gln Arg Lys Pro Val Lys Cys Xaa Asn Cys Gly Lys Ala Gly His Ile

385 390 395 400

Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415

Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg Phe

450 455 460

Gly Glu Glu Thr Thr Pro Xaa Gln Lys Gln Glu Gln Ile Asp Lys Glu

465 470 475 480

Xaa His Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Ser Asp Pro Ser

485 490 495

Ser Gln

<210> 647

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (110)..(110)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (137)..(137)

<223> Xaa can be any naturally occurring amino acid

<220><221

> misc_feature

<222> (151)..(151)

<223> Xaa can be any naturally occurring amino acid

<400> 647

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Ala Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Xaa Ser Lys
100 105 110

Lys Lys Ala Gln His Ala Ala Ala Asp Thr Gly Asn Asn Asn Ser Gln
115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Xaa Asn Ala Gln Gly Gln Leu Val
130 135 140

His Gln Ala Met Ser Pro Xaa Thr Leu Asn Ala Trp Val Lys Val Val
145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu
165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val

180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu

195 200 205

Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val

210 215 220

Ala Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr

225 230 235 240

Thr Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro Pro

245 250 255

Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln

275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys

325 330 335

Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Ser Gln Val Thr Pro Thr Thr Val Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Ser Gln Arg Arg Thr Val Lys Cys Phe Asn Cys Gly Lys Asp Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Asn Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Thr Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Leu Ser Gln

500

<210> 648

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<400> 648

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Asp Leu Asp Arg Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Pro Glu Gly Cys Arg Gln Ile Leu Ser Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Gly Phe Arg Ser Leu Tyr Asn

65 70 75 80

Ala Ile Ser Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His

130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Val Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Ala Gln Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Gly Pro Arg Lys Ile Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Leu Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro Glu Glu

450 455 460

Ser Phe Arg Phe Gly Gly Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu

465 470 475 480

Gln Ile Asp Lys Asp Leu Tyr Pro Leu Asp Ser Leu Arg Ser Leu Phe

485 490 495

Gly Asn Asp Pro Ser Ser Gln

500

<210> 649

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (215)..(215)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (227)..(227)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (453)..(453)

<223> Xaa can be any naturally occurring amino acid

<400> 649

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Lys Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Ala Asn Asn Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Xaa His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Xaa Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Gly Pro Ala Asn Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Gly Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Asn Arg Xaa Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Ala Thr Pro Pro Gln Arg Gln Glu Pro Ile Asn

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 650

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (280)..(280)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222

> (372)..(372)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (499)..(499)

<223> Xaa can be any naturally occurring amino acid

<400> 650

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Ala Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Phe Lys Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Ile Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Thr Ala Ala Asp Thr Gly Asn Ser Asn Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Ala Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Xaa Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365
Gln Val Thr Xaa Pro Ala Thr Ile Met Met Gln Lys Gly Lys Phe Arg

370 375 380

Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Xaa Gln

500

<210> 651

<211> 503

<212> PRT

<213> Human immunodeficiency virus

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<222> (12)..(12)

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<220><221> misc_feature

<222> (34)..(34)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (42)..(42)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (49)..(49)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (51)..(51)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (65)..(65)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (114)..(114)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (131)..(131)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (176)..(176)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (194)..(194)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (198)..(198)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (203)..(203)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (302)..(302)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (320)..(320)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (359)..(359)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (409)..(409)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (441)..(441)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (448)..(448)

<223> Xaa can be any naturally occurring amino acid

<400> 651

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Xaa Leu Asp Thr Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Ser Lys Lys Lys Tyr Gln Leu Lys

20 25 30

His Xaa Val Trp Ala Ser Arg Glu Leu Xaa Arg Phe Ala Val Asn Pro

35 40 45

Xaa Leu Xaa Glu Thr Ser Glu Gly Cys Arg Gln Ile Met Arg Gln Leu

50 55 60

Xaa Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Lys Ser Lys Lys Lys

100 105 110

Ala Xaa Gln Gln Ala Ala Ala Asp Thr Glu Ser Ser Lys Gln Val Ser

115 120 125

Gln Asn Xaa Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln

130 135 140

Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu

145 150 155 160

Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ala Xaa

165 170 175

Gly Ala Thr Pro Gly Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly

180 185 190

His Xaa Ala Ala Met Xaa Met Leu Lys Glu Xaa Ile Asn Glu Glu Ala

195 200 205

Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala Pro

210 215 220

Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser

225 230 235 240

Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile Pro

245 250 255

Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Ile Gly Leu Asn Lys Ile

260 265 270

Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly Pro

275 280 285

Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Xaa Leu Arg

290 295 300

Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr Xaa

305 310 315 320

Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Ser Ile Leu Lys Ala Leu

325 330 335

Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val

340 345 350

Gly Gly Pro Ser His Lys Xaa Arg Val Leu Ala Glu Ala Met Ser Gln

355 360 365

Ala Asn Ser Ala Ala Ile Met Met Gln Lys Gly Asn Phe Arg Asn Gln

370 375 380

Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Leu Ala

385 390 395 400

Arg Asn Cys Arg Ala Pro Arg Lys Xaa Gly Cys Trp Lys Cys Gly Gln

405 410 415

Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe Leu
420 425 430
Gly Lys Phe Trp Pro Ser His Lys Xaa Arg Pro Gly Asn Phe Leu Xaa
435 440 445
Ser Arg Pro Glu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu

450 455 460
Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu
465 470 475 480
Pro Arg Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe
485 490 495
Gly Asn Asp Pro Ser Ser Gln
500

<210> 652
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (15)..(15)

<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (103)..(103)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (115)..(115)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (213)..(213)
<223> Xaa can be any naturally occurring amino acid
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<222> (312)..(312)
<223> Xaa can be any naturally occurring amino acid
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<222> (320)..(320)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (326)..(326)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (332)..(332)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (479)..(479)

<223> Xaa can be any naturally occurring amino acid

<400> 652

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Xaa Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Ile Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Xaa Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Xaa Gln Gln Ala Ala Ala Asp Thr Gly Asp Arg Gly Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Xaa Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Val Ala Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Ile Gly Leu Asn Lys

260 265 270

Val Val Lys Met Tyr Ser Pro Ile Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Xaa Val Lys Asn Trp Met Thr Glu Xaa

305 310 315 320

Leu Leu Val Gln Asn Xaa Asn Pro Asp Cys Lys Xaa Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Ser Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Ala Gln Pro Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Ser Gln Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415
Gly Arg Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Pro Gln Ser Arg Thr Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Lys Glu Thr Xaa Asp
465 470 475 480
Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln
500

<210> 653
<211> 502
<212> PRT
<213> Human immunodeficiency virus
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<223> Xaa can be any naturally occurring amino acid
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<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (444)..(444)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
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<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (489)..(489)
<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (501)..(501)

<223> Xaa can be any naturally occurring amino acid

<400> 653

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Glu Glu Arg Phe Ala Ile Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Ala Gly Cys Lys Gln Ile Leu Ile Gln Leu

50 55 60

Gln Pro Ser Leu Gln Asn Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Xaa His

130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Val Ala Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Thr Asn Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Xaa Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Val Trp Pro Ser His Lys Gly Xaa Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Xaa Glu Ser Phe Lys

450 455 460

Phe Val Lys Glu Thr Thr Thr Pro Pro Gln Glu Gln Asn Leu Ile Asp
465 470 475 480
Leu Asp Lys Glu Val Tyr Pro Leu Xaa Ser Leu Arg Ser Leu Phe Gly
485 490 495
Asn Asp Pro Ser Xaa Lys
500

<210> 654
<211> 495
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (426)..(426)
<223
> Xaa can be any naturally occurring amino acid
<400> 654
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Gly Thr Gly Asn Ser Asn Gln Ala

115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Pro Gln Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Asn Ser Gly Ala Ala Met Met Gln Arg Gly Asn Phe Arg Asn

370 375 380
Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile

385 390 395 400

Ala Arg Asn Cys Lys Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415

Arg Glu Gly His Gln Met Lys Asp Cys Xaa Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg Phe

450 455 460

Val Glu Glu Thr Thr Thr Pro Ser Gln Lys Pro Glu Glu Leu Tyr Pro

465 470 475 480

Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln

485 490 495

<210> 655

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<400> 655

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Ile Asn Pro

35 40 45

Gly Leu Leu Glu Ser Ser Gly Gly Cys Lys Gln Ile Leu Ala Gln Leu

50 55 60

Gln Pro Ala Leu Lys Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Gln

100 105 110

Lys Lys Ala Gln Gln Ala Ala Thr Asp Thr Gly Asn Ser Ser Ser Asn
115 120 125

Gln Val Ser Arg Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140
Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160
Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala
165 170 175
Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205
Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Ala Gln Ala Gly Pro
210 215 220
Ile Ala Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240
Thr Thr Ser Thr Leu Gln Glu Gln Ile Thr Trp Met Thr Asn Asn Pro
245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu
260 265 270
Asn Lys Ile Val Arg Met Tyr Ser Pro Ile Ser Ile Leu Asp Ile Arg
275 280 285
Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
290 295 300
Thr Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr
305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335
Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350
Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Val Asn Pro Asn Asn Val Met Met Gln Arg Gly Asn Phe

370 375 380

Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Arg Asn Cys Lys Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Ala Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn

435 440 445

Phe Pro Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Cys Phe

450 455 460

Gly Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Thr

465 470 475 480

Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn

485 490 495

Asp Pro Ser Ser Gln

500

<210> 656

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (394)..(394)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (437)..(437)

<223> Xaa can be any naturally occurring amino acid

<400> 656

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Gly Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Thr Ala Asp Thr Gly Asn Asn Asn Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Asp Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Ser Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Asn Ser Ala Thr Val Met Met Gln Arg Gly Asn Phe Arg Asn

370 375 380

Pro Arg Lys Thr Val Lys Cys Phe Asn Xaa Gly Lys Glu Gly His Ile

385 390 395 400

Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415

Lys Glu Gly His Gln Met Arg Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Xaa Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Asn Arg Pro Glu Pro Thr Ala Pro Ser Ala Pro Pro Glu Glu Ser

450 455 460

Phe Arg Phe Gly Glu Gly Thr Thr Ala Pro Ser Gln Lys Gln Glu Pro

465 470 475 480

Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly

485 490 495

Ser Asp Pro Ser Ser Gln

500

<210> 657

<211> 508

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (399)..(399)

<223> Xaa can be any naturally occurring amino acid

<400> 657

Met Gly Ala Arg Ala Ser Ile Leu Ser Ala Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Ile Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Thr Gln Gln Ala Ala Ala Gly Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Ser Ala Ala Ile Met Met Gln Lys Gly Asn

370 375 380

Phe Gly Asn Gln Arg Lys Thr Val Lys Cys Cys Asn Cys Gly Xaa Val

385 390 395 400

Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp

405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Asn Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Pro Thr

450 455 460

Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Ala Ala Ala Thr Pro

465 470 475 480

Ser Gln Lys Gln Glu Pro Ile Asp Lys Asp Leu Tyr Pro Leu Ala Ser

485 490 495

Leu Arg Ser Leu Phe Gly Asn Asp Gln Leu Ser Gln

500 505

<210> 658

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (411)..(411)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222>

(465)..(465)

<223> Xaa can be any naturally occurring amino acid

<400> 658

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Ala Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Thr Ser Ser Ser Ser

115 120 125

Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln

130 135 140

Met Val His Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys

145 150 155 160

Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser

165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn

180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile

195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly

210 215 220

Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala

225 230 235 240

Gly Thr Thr Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn

245 250 255

Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly

260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile

275 280 285

Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr

290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met

305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile

325 330 335

Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala

340 345 350

Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu

355 360 365

Ala Met Ser Gln Ala Thr Asn Ser Ala Asn Ile Met Met Gln Arg Gly

370 375 380

Asn Phe Gly Lys Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys

385 390 395 400

Glu Gly His Ile Ala Lys Asn Cys Arg Ala Xaa Arg Lys Arg Gly Cys

405 410 415

Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg

420 425 430

Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro

435 440 445

Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu

450 455 460

Xaa Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu

465 470 475 480

Thr Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe

485 490 495

Gly Asn Asp Pro Ser Ser Gln

500

<210> 659

<211> 505

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (404)..(404)

<223> Xaa can be any naturally occurring amino acid

<400> 659

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Arg Asn Thr Ala Asp Thr

115 120 125

Lys Ser Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln

130 135 140

Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp

145 150 155 160

Val Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met

165 170 175

Phe Ser Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met

180 185 190

Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu

195 200 205

Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Val His Pro Val Gln

210 215 220

Ala Gly Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp

225 230 235 240

Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr

245 250 255

Ser Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile

260 265 270

Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu
275 280 285
Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg

290 295 300
Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn
305 310 315 320
Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys
325 330 335
Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met
340 345 350
Thr Ala Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Ile Leu

355 360 365
Ala Glu Ala Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln
370 375 380
Arg Gly Asn Phe Arg Asn Gln Arg Lys Ser Val Lys Cys Phe Asn Cys
385 390 395 400
Gly Lys Arg Xaa His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys
405 410 415
Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr

420 425 430
Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly
435 440 445
Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro
450 455 460
Ala Glu Cys Phe Arg Phe Gly Glu Glu Thr Ala Thr Pro Pro Gln Lys
465 470 475 480
Gln Glu Pro Ile Glu Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser

485 490 495
Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 660

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 660

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Arg Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Gly Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Ser
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Val Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Val Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Met Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Asn Val Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asp Gln Arg Lys Lys Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Leu Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Ser Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Leu Leu Gln

500

<210> 661

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (188)..(188)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (201)..(201)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (215)..(215)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (295)..(295)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (498)..(498)

<223> Xaa can be any naturally occurring amino acid

<400> 661

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Val Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Arg Asn Ile Gln Gly Gln Met Val His

130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Xaa Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Xaa Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Xaa His Pro Ala Gln Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Asp Trp Met Thr His Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Xaa Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365
Gln Met Thr Asn Ala Thr Asn Ile Met Met Gln Gly Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Phe Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Leu Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Asn Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Gly Cys Arg
450 455 460
Tyr Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480
Gln Glu Lys Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Ser Asp

485 490 495
Pro Xaa Ser Gln
500

<210> 662
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<400> 662
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Ala Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Val Tyr Asn

65 70 75 80

Thr Val Ala Thr Ile Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Thr Gln Gln Ala Ala Ala Gly Ala Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ser His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser

355 360 365
Gln Val Thr Ser Pro Thr Thr Ile Met Met Gln Arg Gly Asn Phe Lys
370 375 380
Asn Pro Arg Arg Ser Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Arg Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Val Glu Gly Gln Ala Asn

420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Ala Thr Pro Pro Gln Lys Gln Glu Pro Thr Asp
465 470 475 480
Arg Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495
Pro Ser Ser Gln

500

<210> 663

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (7)..(7)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (24)..(24)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (34)..(34)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222

> (48)..(48)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (51)..(51)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (54)..(54)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (75)..(75)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (81)..(81)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (91)..(91)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (98)..(98)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (100)..(100)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (103)..(103)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (123)..(123)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (129)..(129)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (150)..(150)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (167)..(167)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (169)..(169)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (357)..(357)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (367)..(367)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (473)..(473)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (497)..(497)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (500)..(500)

<223> Xaa can be any naturally occurring amino acid

<400> 663

Met Gly Ala Arg Ala Ser Xaa Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Xaa Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Xaa Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Xaa
35 40 45

Gly Leu Xaa Glu Thr Xaa Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Xaa Lys Ser Leu Tyr Asn
65 70 75 80

Xaa Ile Ala Val Leu Tyr Cys Val His Gln Xaa Ile Asp Val Lys Asp
85 90 95

Thr Xaa Glu Xaa Leu Asp Xaa Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Val His Xaa Asp Thr Gly Asn Ser
115 120 125

Xaa Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln
130 135 140

Met Val His Gln Pro Xaa Ser Pro Arg Thr Leu Asn Ala Trp Val Lys
145 150 155 160

Val Val Glu Glu Lys Ala Xaa Ser Xaa Glu Val Ile Pro Met Phe Ser
165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn
180 185 190

Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile

195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly
210 215 220
Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala
225 230 235 240
Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn
245 250 255
Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly
260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile
275 280 285
Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr
290 295 300
Lys Val Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met
305 310 315 320
Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile
325 330 335

Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala
340 345 350
Cys Gln Gly Val Xaa Gly Pro Gly His Lys Ala Arg Val Leu Xaa Glu
355 360 365
Ala Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly
370 375 380
Asn Phe Arg Gly Pro Arg Lys Asn Val Lys Cys Phe Asn Cys Gly Arg
385 390 395 400

Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys
405 410 415
Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg
420 425 430
Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro
435 440 445

Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu
450 455 460

Ser Phe Arg Phe Gly Glu Glu Thr Xaa Pro Ser Gln Lys Pro Glu Pro
465 470 475 480
Ile Asp Lys Asp Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly
485 490 495
Xaa Asp Pro Xaa Ser Gln
500

<210> 664
<211> 504
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (92)..(92)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature

<222> (314)..(314)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (410)..(410)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (436)..(436)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (453)..(453)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (467)..(467)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature

<222> (469)..(469)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (471)..(471)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (478)..(478)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (481)..(481)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (485)..(485)

<223> Xaa can be any naturally occurring amino acid

<400> 664

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Val Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Lys Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Xaa Asp Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Asn Thr Gly Asn

115 120 125

Ser Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly

130 135 140

Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val
145 150 155 160
Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe
165 170 175
Thr Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu
180 185 190
Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr

195 200 205
Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Met His Pro Val His Ala
210 215 220
Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile
225 230 235 240
Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser
245 250 255
Asn Pro Ala Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu

260 265 270
Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp
275 280 285
Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe
290 295 300
Tyr Lys Thr Leu Arg Ala Glu Gln Ala Xaa Gln Asp Val Lys Asn Trp
305 310 315 320
Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr

325 330 335
Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr
340 345 350
Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala
355 360 365
Glu Ala Met Ser Gln Val Thr Asn Ser Ala Ser Ile Met Met Gln Arg
370 375 380
Gly Asn Phe Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly

385 390 395 400

Lys Glu Gly His Ile Ala Arg Asn Cys Xaa Ala Pro Arg Lys Lys Gly

405 410 415

Cys Trp Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu

420 425 430

Arg Gln Ala Xaa Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg

435 440 445

Pro Gly Asn Phe Xaa Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala

450 455 460

Pro Pro Xaa Glu Xaa Phe Xaa Phe Gly Glu Glu Thr Thr Xaa Pro Ser

465 470 475 480

Xaa Lys Gln Glu Xaa Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu

485 490 495

Lys Ser Leu Phe Gly Asn Asp His

500

<210> 665

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 665

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Val Gly Cys Lys Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Ile Ala Thr Leu Tyr Cys Val His Leu Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Gly Thr Gly Asn Asn Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140
Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205
Ala Ala Asp Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys

260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Thr Pro Pro Val Ile Met Met Gln Lys Asp Asn Phe Arg

370 375 380

Asn Gln Lys Arg Thr Val Lys Cys Phe Asn Cys Gly Arg Asp Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Met Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 666

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (467)..(467)

<223> Xaa can be any naturally occurring amino acid

<400> 666

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

```
            20                  25                  30
His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
        35                  40                  45
Ser Leu Leu Glu Thr Pro Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
    50                  55                  60

His Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65                  70                  75                  80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Asn Ile Asp Val Lys Asp
                85                  90                  95
Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
            100                 105                 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Ser Ser Ser Gln Val
        115                 120                 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
    130                 135                 140
Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145                 150                 155                 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
                165                 170                 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
            180                 185                 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
        195                 200                 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
    210                 215                 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225                 230                 235                 240
Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
                245                 250                 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
            260                 265                 270
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Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Ser Thr Ala Val Met Met Gln Lys Gly Thr Phe Arg
370 375 380

Asn Gln Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Arg Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460

Phe Gly Xaa Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Leu Ile Asp
465 470 475 480

Leu Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly
485 490 495

Asn Asp Pro Ser Ser Lys
500

<210> 667

<211> 505

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (5)..(5)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (16)..(16)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (73)..(73)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (78)..(78)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (120)..(120)

<223> Xaa can be any naturally occurring amino acid

<220

><221> misc_feature

<222> (220)..(220)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (478)..(478)

<223> Xaa can be any naturally occurring amino acid

<400> 667

Met Gly Ala Arg Xaa Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Xaa

1 5 10 15

Lys Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Lys Gln Ile Leu Gln Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Xaa Glu Leu Lys Ser Xaa Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Asn Lys Ile Glu Val Arg Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110
Lys Arg Ala Gln Gln Ala Ala Xaa Asp Thr Gly Asn Asn Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His
130 135 140
Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu Ser

165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Xaa Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Met Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300
Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Gly Ser Ala Thr Ile Met Met Gln Gly Gly Asn Tyr Lys

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Lys Ser Glu Thr Thr Arg Ile Glu Pro Thr Ala Pro Pro

450 455 460

Ala Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Xaa Gln Lys

465 470 475 480

Pro Glu Leu Ile Asp Lys Glu Met Tyr Pro Leu Ala Ser Leu Arg Ser

485 490 495

Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505

<210> 668

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (297)..(297)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (442)..(442)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (446)..(446)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (448)..(448)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (451)..(451)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (482)..(482)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (488)..(488)

<223> Xaa can be any naturally occurring amino acid

<400> 668

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Arg Trp
1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Gly Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Gln Thr Ala Ala Ala Asp Thr Gly

115 120 125

Ser Asn Asn Gln Val Ser His Asn Tyr Pro Ile Val Gln Asn Ile Gln

130 135 140

Gly Gln Met Val His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp

145 150 155 160

Val Lys Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met

165 170 175

Phe Thr Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met

180 185 190

Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu

195 200 205

Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His

210 215 220

Ala Gly Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp

225 230 235 240

Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr

245 250 255

Asn Asn Pro Pro Val Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile

260 265 270

Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu

275 280 285

Asp Ile Lys Gln Gly Pro Lys Glu Xaa Phe Arg Asp Tyr Val Asp Arg

290 295 300

Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn

305 310 315 320

Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys

325 330 335

Thr Ile Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Asp Met Met

340 345 350

Thr Ala Cys Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu
355 360 365

Ala Glu Ala Met Ser Gln Met Asn Ser Thr Thr Val Met Met Gln Arg
370 375 380

Gly Asn Phe Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly
385 390 395 400

Lys Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly
405 410 415

Cys Trp Lys Cys Gly Gln Glu Gly His Gln Met Lys Asp Cys Thr Glu
420 425 430

Arg Gln Ala Asn Phe Leu Gly Lys Ile Xaa Pro Ser His Xaa Gly Xaa
435 440 445

Pro Gly Xaa Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu
450 455 460

Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln
465 470 475 480

Glu Xaa Lys Glu Leu Tyr Pro Xaa Thr Ser Leu Arg Ser Leu Phe Gly
485 490 495

Asn Asp Pro Leu Ser Gln
500

<210> 669

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 669

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Ile Trp Ala Ser Arg Glu Leu Glu Arg Phe Ser Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Phe

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Asn Lys Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His
130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Ala Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Ala Ala Gly Pro Val Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ser Ala Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asp Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Asp Gly His
385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Glu Arg Gln
420 425 430
Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly
435 440 445
Asn Phe His Gln Ser Arg Leu Glu Pro Thr Ala Pro Pro Glu Glu Ser
450 455 460

Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Arg Gln Glu Pro
465 470 475 480
Lys Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly
485 490 495
Asn Asp Pro Ser Ser Gln
500

<210> 670
<211> 498
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (497)..(497)

<223> Xaa can be any naturally occurring amino acid

<400> 670

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Ser Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Ser Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp

85 90 95

Thr Gln Glu Ala Leu Glu Lys Ile Lys Glu Glu Gln Asp Lys Ser Lys

100 105 110

Lys Arg Ala Gln Gln Ala Glu Ala Gly Thr Gly Asn Ser Ser Gln Ala

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Pro Leu Thr Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Met His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Asn Ser Thr Asn Ile Met Met Gln Lys Gly Asn Val Arg Asn

370 375 380

Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile

385 390 395 400

Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415

Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn Phe Pro

435 440 445

Gln Ser Arg Thr Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe

450 455 460

Gly Glu Gln Thr Thr Pro His Gln Lys Gln Glu Pro Ile Asp Gln Glu

465 470 475 480

Arg Ser Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Leu

485 490 495

Xaa Gln

<210> 671

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (128)..(128)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (159)..(159)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (219)..(219)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (372)..(372)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (400)..(400)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (481)..(481)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (502)..(502)

<223> Xaa can be any naturally occurring amino acid

<400> 671

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Arg Leu Lys

```
            20                  25                  30
His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
        35                  40                  45

Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Arg Ile Leu Lys Gln Leu
    50                  55                  60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65                  70                  75                  80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Gly Val Arg Asp
                85                  90                  95
Thr Lys Glu Ala Leu Asp Lys Val Glu Glu Glu Gln Asn Glu Ser Lys
            100                 105                 110

Lys Lys Thr Gln Gln Ala Ala Ala Gly Thr Gly Asn Asn Ser Gln Xaa
        115                 120                 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
    130                 135                 140
Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Xaa Glu
145                 150                 155                 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
                165                 170                 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
            180                 185                 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
        195                 200                 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val Xaa Ala Gly Pro Val Ala
    210                 215                 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225                 230                 235                 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
                245                 250                 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
            260                 265                 270
```

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Xaa Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Lys
370 375 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly Xaa
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Gln Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro Glu Glu
450 455 460
Ser Phe Arg Phe Gly Glu Lys Thr Thr Thr Pro Pro Gln Lys Gln Glu
465 470 475 480
Xaa Leu Asp Lys Glu Leu Tyr Pro Val Thr Ser Leu Arg Ser Leu Phe
485 490 495

Gly Asn Asp Pro Ser Xaa Gln
500

<210> 672

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<400> 672

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Asn Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Ile Glu Thr Ala Glu Gly Cys Lys Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Lys Arg Ile Glu Val Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Asn Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Glu Ala Asp Thr Gly Asn Ser Lys Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Ala Gln Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Val
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys His Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Ser Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Ser Ala Ala Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380

Ser Gln Arg Lys Pro Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Thr Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460

Phe Gly Glu Glu Thr Thr Ala Pro Ala Gln Lys Gln Glu Pro Ile Val

465 470 475 480

Lys Glu Met Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 673

<211> 507

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (82)..(82)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (360)..(360)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (380)..(380)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (397)..(397)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (399)..(399)

<223> Xaa can be any naturally occurring amino acid

<400> 673

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Xaa Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Thr Gln Gln Ala Ala Ala Ala Ala Ala Ala Ala Ala Ala Asp
115 120 125

Thr Gly Asn Arg Gly Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn
130 135 140

Leu Gln Gly Gln Met Val His Gln Pro Ile Ser Pro Arg Thr Leu Asn
145 150 155 160

Ala Trp Val Lys Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile
165 170 175

Pro Met Phe Thr Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn
180 185 190

Thr Met Leu Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Met Leu
195 200 205

Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro
210 215 220

Val His Ala Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly
225 230 235 240

Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp
245 250 255

Met Thr Asn Asn Pro Ala Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp
260 265 270

Ile Ile Leu Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser
275 280 285

Ile Leu Asp Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val
290 295 300

Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val
305 310 315 320
Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp
325 330 335
Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu
340 345 350
Met Met Thr Ala Cys Gln Gly Xaa Gly Gly Pro Ser His Lys Ala Arg
355 360 365

Val Leu Ala Glu Ala Met Ser Gln Ala Thr Asn Xaa Ala Thr Val Met
370 375 380
Met Gln Arg Gly Asn Phe Arg Asn Gln Arg Lys Thr Xaa Lys Xaa Phe
385 390 395 400
Asn Cys Gly Lys Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg
405 410 415
Lys Arg Gly Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp
420 425 430

Cys Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His
435 440 445
Lys Gly Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala
450 455 460
Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Ala Thr Ala Pro Pro
465 470 475 480
Gln Lys Gln Glu Pro Thr Asp Lys Asp Leu Tyr Pro Leu Ala Ser Leu
485 490 495

Arg Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln
500 505

<210> 674
<211> 499
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (84)..(84)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (86)..(86)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (181)..(181)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (208)..(208)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (226)..(226)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (253)..(253)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (389)..(389)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (447)..(447)

<223> Xaa can be any naturally occurring amino acid

<400> 674

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Asp Gly Cys Lys Lys Ile Leu Gly Gln Leu

50 55 60

His Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Xaa Leu Xaa Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Gln

100 105 110

Lys Lys Ala Gln Gln Thr Ala Ala Gly Thr Gly Ser Gly Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Xaa Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Xaa

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Xaa Gln Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Gly Xaa Pro Ala Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Met Asn Ser Ala Asn Val Met Met Gln Gln Gly Asn Phe Lys Gly

370 375 380

Gln Arg Arg Ile Xaa Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile

385 390 395 400

Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415

Lys Glu Gly His Gln Met Lys Asp Cys Thr Asn Gly Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Val Trp Pro Ser Ser Lys Gly Arg Pro Gly Xaa Phe

435 440 445

Pro Gln Ser Arg Ile Glu Pro Ser Ala Pro Pro Glu Glu Ser Leu Arg

450 455 460

Phe Gly Glu Glu Met Thr Pro Pro Gln Lys Gln Gly Gln Thr Asp Lys

465 470 475 480

Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Ser Asp Pro

485 490 495

Ser Ser Gln

<210> 675

<211> 500

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (34)..(34)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (40)..(40)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (66)..(66)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (93)..(93)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (122)..(122)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (139)..(139)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (269)..(269)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (304)..(304)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (341)..(341)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (465)..(465)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (471)..(471)

<223> Xaa can be any naturally occurring amino acid

<400> 675

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Xaa Val Trp Ala Ser Arg Xaa Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Xaa Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Xaa Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Xaa Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Xaa Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Xaa Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Xaa

290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Xaa Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Ser Ser Ala Thr Val Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Pro Val Lys Cys Phe Asn Cys Gly Lys Asp Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Xaa Gly Glu Glu Thr Thr Xaa Pro Ser Gln Lys Gln Glu Thr Ile Asp

465 470 475 480

Lys Asp Leu Tyr Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Thr

500

<210> 676

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<220

><221> misc_feature

<222> (2)..(2)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (413)..(413)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (415)..(415)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (464)..(464)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (477)..(477)

<223> Xaa can be any naturally occurring amino acid

<

220><221> misc_feature

<222> (479)..(479)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (483)..(483)

<223> Xaa can be any naturally occurring amino acid

<400> 676

Met Xaa Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Ala Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Asp Gly Cys Arg Gln Ile Leu Met Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Val Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Val Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Thr Gly Glu Ser Ser Arg Glu

115 120 125

Asn Ser Gln Val Ser His Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly

130 135 140

Gln Met Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val

145 150 155 160

Lys Val Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe

165 170 175

Thr Ala Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu

180 185 190

Asn Thr Val Gly Gly His Gln Ala Ala Met Gln Ile Leu Lys Glu Thr

195 200 205

Ile Asn Glu Glu Ala Ala Asp Trp Asp Arg Val His Pro Val His Ala

210 215 220

Gly Pro Ile Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile

225 230 235 240

Ala Gly Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser

245 250 255

Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu

260 265 270

Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp

275 280 285

Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe

290 295 300

Tyr Lys Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp
305 310 315 320
Met Thr Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr
325 330 335
Ile Leu Lys Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr
340 345 350
Ala Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala

355 360 365
Glu Ala Met Ser Gln Val Thr Asn Ser Ala Thr Val Met Met Gln Lys
370 375 380
Gly Asn Phe Arg Asn Gln Lys Lys Ile Val Lys Cys Phe Asn Cys Gly
385 390 395 400
Lys Val Gly His Ile Ala Arg Asn Cys Arg Ala Pro Xaa Lys Xaa Gly
405 410 415
Cys Trp Lys Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Asn Glu

420 425 430
Gly Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg
435 440 445
Pro Gly Asn Phe Pro Gln Ser Arg Leu Glu Pro Thr Ala Pro Pro Xaa
450 455 460
Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Pro Pro Xaa Lys Xaa Glu
465 470 475 480
Pro Thr Xaa Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe

485 490 495
Gly Asn Asp Pro Ser Ser Gln
500

<210> 677
<211> 501
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (101)..(101)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (210)..(210)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (222)..(222)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (243)..(243)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (269)..(269)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (304)..(304)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (323)..(323)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (338)..(338)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (429)..(429)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (442)..(442)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (484)..(484)

<223> Xaa can be any naturally occurring amino acid

<400> 677

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Ile Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Lys Arg Ile Leu Ile Gln Leu

50 55 60

His Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Gln Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Xaa Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Gln Glu Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln

115 120 125

Val Ser His Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val

130 135 140

His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val

145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu

165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val

180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu

195 200 205

Glu Xaa Ala Glu Trp Asp Arg Leu His Pro Val His Ala Xaa Pro Ile

210 215 220

Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr

225 230 235 240

Thr Ser Xaa Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro

245 250 255

Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Xaa Gly Leu Asn
260 265 270
Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln

275 280 285
Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Xaa
290 295 300
Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu
305 310 315 320
Thr Leu Xaa Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys
325 330 335
Ala Xaa Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350
Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met
355 360 365
Ser Gln Val Thr Ser Ser Ala Thr Val Met Met Gln Arg Gly Asn Gly
370 375 380
Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Arg Glu Gly
385 390 395 400
His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415
Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Xaa Arg Gln Ala
420 425 430
Asn Phe Leu Gly Lys Ile Trp Pro Ser Xaa Lys Gly Arg Pro Gly Asn
435 440 445
Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe
450 455 460
Arg Phe Gly Glu Glu Thr Thr Thr Pro Ala Gln Lys Gln Glu Pro Ile

465 470 475 480
Asp Lys Glu Xaa Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn
485 490 495
Asp Pro Ser Ser Gln

500

<210> 678

<211> 504

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (4)..(4)

<223> Xaa can be any naturally occurring amino acid

<400> 678

Met Gly Ala Xaa Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Ile Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Ser Gln
115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val
130 135 140

His Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile
145 150 155 160

Glu Glu Lys Asn Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu
165 170 175

Ala Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val

180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu

195 200 205

Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val

210 215 220

Ala Pro Gly Gln Leu Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr

225 230 235 240

Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro Pro

245 250 255

Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln

275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys

325 330 335

Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Ser Gln Val Thr Asn Pro Ala Thr Val Met Val Gln Lys Gly Asn Phe

370 375 380

Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys

405 410 415

Cys Gly Gln Glu Gly His Gln Met Lys Asp Cys Ser Glu Arg Gln Ala

420 425 430

Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn
435 440 445
Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe
450 455 460

Arg Phe Gly Glu Gly Thr Thr Thr His Pro Gln Lys Gln Glu Lys Gln
465 470 475 480
Glu Pro Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu
485 490 495
Phe Gly Asn Asp Pro Ser Ser Gln
500

<210> 679
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (119)..(119)
<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
<222> (138)..(138)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (354)..(354)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (486)..(486)
<223> Xaa can be any naturally occurring amino acid
<400> 679
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Asp Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Gly Gly Cys Lys Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ala Leu Arg Thr Gly Ser Glu Glu Leu Thr Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Val Leu Phe Cys Val His Gln Lys Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Xaa Ala Asp Ala Gly Asn Lys Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Xaa Gln Gly Gln Met Val His

130 135 140

Gln Pro Ile Ala Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro Pro Ile

245 250 255

Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350
Val Xaa Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Pro Ala Thr Val Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415
Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Ile Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480
Lys Glu Gln Tyr Pro Xaa Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln
500

<210> 680
<211> 500
<212> PRT
<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (93)..(93)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (188)..(188)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (286)..(286)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (310)..(310)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (334)..(334)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (359)..(359)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (406)..(406)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (442)..(442)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (444)..(444)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (460)..(460)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (471)..(471)

<223> Xaa can be any naturally occurring amino acid

<400> 680

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Asp Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Xaa Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Asn Gln Val
115 120 125

Ser Arg Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Asn Val His
130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Xaa Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Ile Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Val Met Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Xaa Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Xaa Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys His Ile Xaa Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ala His Xaa Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Leu Arg
370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400

Ile Ala Arg Asn Cys Xaa Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser Pro Xaa Gly Xaa Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Xaa Glu Ser Phe Arg
450 455 460

Phe Gly Glu Glu Pro Thr Xaa Pro Pro Gln Glu Leu Gly Gln Lys Asp
465 470 475 480
Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 681

<211> 505

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (62)..(62)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (82)..(82)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (125)..(125)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (138)..(138)

<223> Xaa can be any naturally occurring amino acid

<400> 681

Met Gly Ala Arg Ala Ser Val Leu Ser Ala Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Xaa Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Xaa Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Ile Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Gln Ala Gln Gln Ala Ala Ala Gly Thr Gly Asn Xaa Ser Gln Ala
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Xaa Gln Gly Gln Met Val His
130 135 140
Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ala
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Val Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Ala Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Val Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Thr Ala Pro Pro Val Glu Pro Thr Ala Pro Pro
450 455 460
Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys
465 470 475 480

Gln Glu Leu Thr Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser
485 490 495
Leu Phe Gly Asn Asp Pro Leu Ser Gln
500 505

<210> 682
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (56)..(56)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (146)..(146)
<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (166)..(166)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (168)..(168)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (260)..(260)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (283)..(283)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (327)..(327)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature

<222> (353)..(353)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (390)..(390)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (428)..(428)
<223> Xaa can be any naturally occurring amino acid
<400> 682

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Thr Glu Xaa Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Lys Lys Ile Asp Val Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys
100 105 110

Ala Lys Ala Gln Gln Ala Ala Ala Gly Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Xaa Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Xaa Glu Xaa Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255

Pro Val Gly Xaa Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Xaa Asp Ile Lys Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Xaa Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Xaa Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Thr Ser Asn Ala Ile Met Met Gln Arg Gly Asn Phe
370 375 380
Arg Asn Thr Lys Lys Xaa Val Lys Cys Phe Asn Cys Gly Lys Glu Gly
385 390 395 400
His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys
405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Xaa Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Arg Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Gln Ile Asp
465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln
500

<210> 683
<211> 504
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (9)..(9)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (26)..(26)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (29)..(29)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (73)..(73)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (91)..(91)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (185)..(185)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (215)..(215)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (217)..(217)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (219)..(219)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (223)..(223)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (230)..(230)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (389)..(389)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (407)..(407)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (413)..(413)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (435)..(435)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (451)..(451)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (453)..(453)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (477)..(477)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (489)..(489)

<223> Xaa can be any naturally occurring amino acid

<400> 683

Met Gly Ala Arg Ala Ser Val Leu Xaa Gly Gly Lys Leu Asp Arg Trp
1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Xaa Lys Lys Xaa Lys Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Xaa Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Xaa Ile Glu Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Val Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Asn Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gly Asp Leu Xaa Thr Met Leu Asn Ser Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Xaa His Xaa Val Xaa Ala Gly Pro Xaa Ala

210 215 220

Pro Gly Gln Met Arg Xaa Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Thr Ser Asn Ala Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Gly Lys Xaa Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Leu Ala Arg Asn Cys Lys Xaa Pro Arg Lys Lys Gly Xaa Trp Lys Cys
405 410 415
Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Xaa Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Xaa Arg Xaa Glu Pro Thr Ala Pro Pro Ala Glu Pro Thr Ala
450 455 460
Pro Pro Ala Glu Ser Phe Arg Phe Gly Glu Glu Thr Xaa Thr Pro Pro
465 470 475 480
Gln Lys Gln Glu Ser Met Asp Lys Xaa Met Tyr Pro Leu Ala Ser Leu
485 490 495

Arg Ser Leu Phe Gly Asn Asp Pro
500

<210> 684
<211> 500
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (278)..(278)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature

<222> (446)..(446)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (471)..(471)

<223> Xaa can be any naturally occurring amino acid

<400> 684

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Val Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Lys Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Arg Lys Thr Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Xaa Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Arg Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Tyr Arg

370 375 380

Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Lys Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Leu Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Gln Lys Gly Arg Pro Xaa Asn Phe

435 440 445

Pro Gln Gly Arg Leu Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Ser Gly Glu Glu Thr Thr Xaa Pro Asp Gln Lys Gln Glu Arg Thr Asp
465 470 475 480
Lys Glu Met Tyr Pro Val Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495
Pro Leu Ser Gln
500

<210> 685
<211> 507
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (431)..(431)
<223> Xaa can be any naturally occurring amino acid

<400> 685
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Gly Gln Phe
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Asn Ile Glu Val Leu Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Lys Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val Pro Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Pro Val
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Leu Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Gly Ala Asn Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Gly Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Gly
370 375 380

Asn Gln Arg Arg Ile Val Lys Cys Phe Asn Cys Gly Lys Asp Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Asp Gly Arg Gln Xaa Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Pro Thr Ala Pro
450 455 460
Pro Ala Glu Ser Phe Gln Phe Gly Glu Glu Met Asn Pro Pro Gln Lys
465 470 475 480
Gln Glu Gly Thr Asp Lys Gly Gln Gly Tyr Pro Pro Leu Ala Ser Leu
485 490 495
Lys Ser Leu Phe Gly Ser Asp Pro Leu Leu Gln
500 505

<210> 686

<211> 503

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (435)..(435)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (470)..(470)

<223> Xaa can be any naturally occurring amino acid

<400> 686

Met Gly Ala Arg Ala Ser Val Leu Ser Ala Gly Asp Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Ile Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Gln Lys Thr Gln Gln Ala Ala Ala Ala Thr Gly Ser Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Ala Met Val His
130 135 140
Gln Pro Met Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Val Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Thr His Pro Val His Ala Gly Pro Val Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Pro Val
245 250 255
Gln Val Gly Glu Ile Tyr Lys Arg Trp Ile Val Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Thr Ala Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Xaa Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Pro Pro Glu Glu
450 455 460
Ser Phe Arg Phe Gly Xaa Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu
465 470 475 480

Pro Ile Asp Lys Asp Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe
485 490 495
Gly Asn Asp Pro Ser Ser Gln
500

<210> 687

<211> 510

<212> PRT

<213> Human immunodeficiency virus

<220><221> misc_feature

<222> (25)..(25)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (56)..(56)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (61)..(61)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (88)..(88)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (328)..(328)

<223> Xaa can be any naturally occurring amino acid

<400> 687

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Xaa Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Gly Xaa Cys Arg Gln Ile Xaa Glu Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Xaa His Gln Lys Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Val Glu Glu Glu Arg Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Ser Asn Ser Asn Gln

115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val

130 135 140

His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val

145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu

165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val

180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu

195 200 205

Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val

210 215 220

Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr

225 230 235 240

Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Pro

245 250 255

Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln

275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Arg Thr

290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ala Xaa Pro Asp Cys Lys Thr Ile Leu Lys

325 330 335

Ala Leu Gly Pro Ala Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met
355 360 365
Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe
370 375 380
Arg Ser Gln Gly Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly
385 390 395 400
His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys
405 410 415

Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala
420 425 430
Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn
435 440 445
Phe Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Gln Ser Arg Thr Glu
450 455 460
Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr
465 470 475 480

Thr Pro His Gln Lys Gln Glu Pro Ile Asp Lys Glu Leu Tyr Pro Leu
485 490 495
Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Leu Ser Gln
500 505 510

<210> 688
<211> 502
<212> PRT
<213> Human immunodeficiency virus
<220><221> misc_feature
<222> (165)..(165)
<223> Xaa can be any naturally occurring amino acid
<220><221> misc_feature
<222> (179)..(179)
<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature
<222> (181)..(181)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (190)..(190)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (201)..(201)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (231)..(231)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (242)..(242)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (245)..(245)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (247)..(247)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (279)..(279)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (309)..(309)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (313)..(313)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (331)..(331)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (362)..(362)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (378)..(378)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (383)..(383)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (390)..(390)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (420)..(420)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (429)..(429)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (449)..(449)

<223> Xaa can be any naturally occurring amino acid

<220><221> misc_feature

<222> (475)..(475)

<223> Xaa can be any naturally occurring amino acid

<400> 688

Met Gly Ala Arg Ala Ser Val Leu Ser Ala Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Thr Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Lys Leu
115 120 125
Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140

Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160
Ile Glu Glu Lys Xaa Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala
165 170 175
Leu Ser Xaa Gly Xaa Thr Pro Gln Asp Leu Asn Thr Met Xaa Asn Thr
180 185 190
Val Gly Gly His Gln Ala Ala Met Xaa Met Leu Lys Glu Thr Ile Asn
195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro
210 215 220
Val Ala Pro Gly Gln Leu Xaa Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240
Thr Xaa Ser Asn Xaa Gln Xaa Gln Ile Ala Trp Met Thr His Asn Pro
245 250 255
Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu
260 265 270

Asn Lys Ile Val Arg Met Xaa Ser Pro Ile Ser Ile Leu Glu Ile Arg
275 280 285
Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
290 295 300
Thr Leu Arg Ala Xaa Gln Ala Ser Xaa Glu Val Lys Asn Trp Met Thr
305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Xaa Cys Lys Thr Ile Leu
325 330 335

Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350

Gln Gly Val Gly Gly Pro Ala His Lys Xaa Arg Val Leu Ala Glu Ala
355 360 365

Met Ser Gln Val Thr Asn Ser Asn Ala Xaa Met Met Gln Arg Xaa Asn
370 375 380

Phe Arg Asn Gln Arg Xaa Pro Val Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400

Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp
405 410 415

Lys Cys Gly Xaa Glu Gly His Gln Met Lys Asp Cys Xaa Glu Arg Gln
420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly
435 440 445

Xaa Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser
450 455 460

Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Xaa Gln Lys Gln Gly Ala
465 470 475 480

Ile Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly
485 490 495

Asn Asp Pro Ser Ser Gln
500

<210> 689

<211> 501

<212> PRT

<213> Human immunodeficiency virus

<400> 689

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Arg Lys Lys Tyr Arg Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Ser Lys Gln Gly Ser Gly Ser
115 120 125
Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val
130 135 140

His Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile
145 150 155 160
Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu
165 170 175
Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val
180 185 190
Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu
195 200 205

Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile
210 215 220
Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr
225 230 235 240
Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro
245 250 255
Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Ile Ser Ile Leu Asp Ile Lys Gln
275 280 285
Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr
290 295 300
Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu
305 310 315 320
Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys
325 330 335

Ala Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln
340 345 350
Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met
355 360 365
Ser Gln Met Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe
370 375 380
Arg Asn Gln Arg Lys Ser Val Lys Cys Phe Asn Cys Gly Lys Glu Gly
385 390 395 400

His Ile Ala Lys Asn Cys Arg Ala Pro Arg Arg Arg Gly Cys Trp Lys
405 410 415
Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala
420 425 430
Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn
435 440 445
Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe
450 455 460

Lys Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Thr Gly
465 470 475 480
Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn
485 490 495
Asp Pro Leu Ser Gln
500

<210> 690

<211> 505

<212> PRT

<213> Human immunodeficiency virus

<400> 690

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Gln Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Gln Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser Ser
115 120 125

Lys Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140

Val His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160

Val Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala
165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn
195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro
210 215 220
Ile Ala Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240
Thr Thr Ser Thr Leu Gln Glu Gln Ile Thr Trp Met Thr Asn Asn Pro
245 250 255
Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Val Leu Gly Leu
260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys
275 280 285
Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Arg
290 295 300
Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr
305 310 315 320
Glu Thr Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335

Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Ser Ala Cys
340 345 350
Gln Gly Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365
Met Ser Gln Val Asn Ser Ser Ala Ile Met Met Gln Arg Gly Asn Phe
370 375 380
Arg Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly
385 390 395 400

His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys
405 410 415
Cys Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala
420 425 430
Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn
435 440 445
Phe Leu Gln Ser Arg Pro Glu Ser Arg Pro Glu Pro Thr Ala Pro Pro

450 455 460

Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys
465 470 475 480
Gln Asp Thr Ile Glu Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser
485 490 495
Leu Phe Gly Ser Asp Pro Ser Ser Gln
500 505

<210> 691
<211> 500
<212> PRT
<213> Artificial Sequence
<220><223> Tailored vaccine antigen episensus sequence
<400> 691
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 692

<211> 502

<212> PRT

<213> Artificial Sequence

<220><223> Tailored vaccine antigen 1 sequence

<400> 692

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Asn Ser

115 120 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met

130 135 140

Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala

165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Ser

180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn

195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro

210 215 220

Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro

245 250 255

Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Thr Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr

305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu

325 330 335

Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350
Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365
Met Ser Gln Ala Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn
370 375 380
Phe Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu

385 390 395 400
Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp
405 410 415
Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln
420 425 430
Val Asn Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly
435 440 445
Asn Phe Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser

450 455 460
Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro
465 470 475 480
Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly
485 490 495
Asn Asp Pro Ser Ser Gln
500

<210> 693
<211> 500
<212> PRT
<213> Artificial Sequence
<220><223> Tailored vaccine antigen 2 sequence
<400> 693

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Pro Ala Ala Ala Asp Thr Gly Ser Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Leu Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile Ile Met Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Lys

370 375 380

Asn Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp

465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Ser Ser Gln

500

<210> 694

<211> 502

<212> PRT

<213> Artificial Sequence

<220><223> Tailored vaccine antigen 3 sequence

<400> 694

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Asn Ser
115 120 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met
130 135 140

Val His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160

Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala
165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
180 185 190

Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn
195 200 205

Glu Glu Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro
210 215 220

Ile Ala Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240
Thr Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro
245 250 255

Pro Ile Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu
260 265 270
Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys
275 280 285
Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys
290 295 300
Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr
305 310 315 320

Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335
Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350
Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365
Met Ser Gln Ala Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn
370 375 380

Phe Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400
Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp
405 410 415
Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln
420 425 430
Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly
435 440 445

Asn Phe Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser
450 455 460
Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro

465 470 475 480

Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly

485 490 495

Asn Asp Pro Ser Ser Gln

500

<210> 695

<211> 501

<212> PRT

<213> Artificial Sequence

<220><223> Tailored vaccine antigen 4 sequence

<400> 695

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Val Gln Gln Ala Ala Ala Ala Asp Thr Gly Asn Ser Asn Gln

115 120 125

Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val

130 135 140

His Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile

145 150 155 160

Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu

165 170 175

Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Ile

180 185 190

Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu

195 200 205

Glu Ala Ala Asp Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val

210 215 220

Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr

225 230 235 240

Thr Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro

245 250 255

Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn

260 265 270

Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln

275 280 285

Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr

290 295 300

Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu

305 310 315 320

Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys

325 330 335

Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln

340 345 350

Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met

355 360 365

Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe

370 375 380

Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly

385 390 395 400

His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys

405 410 415

Cys Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala
420 425 430
Asn Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn

435 440 445
Phe Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe
450 455 460
Arg Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Glu Pro Ile
465 470 475 480
Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn
485 490 495
Asp Pro Ser Ser Gln
500

<210
> 696
<211> 500
<212> PRT
<213> Artificial Sequence
<220><223> Tailored vaccine antigen 5 sequence
<400> 696
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys
20 25 30
His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Asn Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His
130 135 140
Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ala
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Ile Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Ala Thr Asn Pro Ala Thr Ile Met Met Gln Arg Gly Asn Phe Lys
370 375 380
Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp
465 470 475 480
Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 697
<211> 500
<212> PRT
<213> Artificial Sequence
<220><223> EpiGraph antigen 1 sequence
<400> 697
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480
Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 698
<211> 500
<212> PRT

<213> Artificial Sequence

<220><223> Epigraph cocktail antigen 1

<400> 698

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480

Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln
500

<210> 699

<211> 502

<212> PRT

<213> Artificial Sequence

<220><223> Epigraph cocktail antigen 2

<400> 699

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Asn Ser
115 120 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met
130 135 140

Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160

Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala

165 170 175

Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Leu Met Leu Asn Thr
180 185 190
Val Gly Gly His Gln Ala Ala Met Gln Ile Leu Lys Glu Thr Ile Asn
195 200 205
Glu Glu Ala Ala Asp Trp Asp Arg Leu His Pro Val His Ala Gly Pro
210 215 220
Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240

Thr Thr Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro
245 250 255
Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu
260 265 270
Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys
275 280 285
Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Val Tyr Lys
290 295 300

Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr
305 310 315 320
Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335
Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350
Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365

Met Ser Gln Ala Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn
370 375 380
Phe Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400
Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp
405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln
420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly
435 440 445

Asn Phe Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser
450 455 460

Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro
465 470 475 480

Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly
485 490 495

Asn Asp Pro Ser Ser Gln
500

<210> 700

<211> 500

<212> PRT

<213> Artificial Sequence

<220><223> Epigraph cocktail antigen 3

<400> 700

Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Lys Trp Glu Lys
1 5 10 15

Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys His Leu
20 25 30

Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Ile Asn Pro Gly Leu
35 40 45

Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Glu Gln Leu Gln Pro
50 55 60

Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn Thr Val
65 70 75 80

Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp Thr Lys
85 90 95

Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys Lys Lys

100 105 110

Val Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Asn Gln Val Ser Gln
115 120 125
Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His Gln Pro
130 135 140
Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Asp Lys
145 150 155 160
Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ala Ala Leu Ser Glu Gly
165 170 175

Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Ile Gly Gly His
180 185 190
Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu Ala Ala
195 200 205
Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala Pro Gly
210 215 220
Gln Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr
225 230 235 240

Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile Pro Val
245 250 255
Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val
260 265 270
Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly Pro Lys
275 280 285
Glu Ser Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala
290 295 300

Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu
305 310 315 320
Val Gln Asn Ala Asn Pro Asp Cys Arg Thr Ile Leu Lys Ala Leu Gly
325 330 335
Pro Ala Ala Thr Leu Glu Glu Met Met Ser Ala Cys Gln Gly Val Gly
340 345 350

Gly Pro Ser His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser Gln Val
355 360 365

Thr Asn Ser Thr Ala Ile Met Met Gln Arg Gly Asn Phe Lys Asn Gln
370 375 380
Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Arg Glu Gly His Ile Ala
385 390 395 400
Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Arg
405 410 415
Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480
Lys Glu Leu Tyr Pro Leu Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Leu Gln
500

<210> 701
<211> 705
<212> PRT
<213> Artificial Sequence
<220><223> HIV B gag/nef fusion Epigraph 1
<400> 701
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380
Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445
Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480
Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495

Pro Ser Ser Gln Gly Gly Lys Trp Ser Lys Ser Ser Ile Val Gly Trp
500 505 510
Pro Ala Val Arg Glu Arg Met Arg Arg Ala Glu Pro Ala Ala Glu Gly
515 520 525
Val Gly Ala Val Ser Arg Asp Leu Glu Lys His Gly Ala Ile Thr Ser

530 535 540

Ser Asn Thr Ala Ala Thr Asn Ala Asp Cys Ala Trp Leu Glu Ala Gln
545 550 555 560

Glu Glu Glu Glu Val Gly Phe Pro Val Arg Pro Gln Val Pro Leu Arg
565 570 575

Pro Met Thr Tyr Lys Gly Ala Leu Asp Leu Ser His Phe Leu Lys Glu
580 585 590

Lys Gly Gly Leu Glu Gly Leu Ile Tyr Ser Gln Lys Arg Gln Asp Ile
595 600 605

Leu Asp Leu Trp Val Tyr His Thr Gln Gly Tyr Phe Pro Asp Trp Gln
610 615 620

Asn Tyr Thr Pro Gly Pro Gly Ile Arg Tyr Pro Leu Thr Phe Gly Trp
625 630 635 640

Cys Phe Lys Leu Val Pro Val Glu Pro Glu Lys Val Glu Glu Ala Asn
645 650 655

Glu Gly Glu Asn Asn Ser Leu Leu His Pro Met Ser Gln His Gly Met
660 665 670

Asp Asp Pro Glu Lys Glu Val Leu Met Trp Lys Phe Asp Ser Arg Leu
675 680 685

Ala Phe His His Met Ala Arg Glu Leu His Pro Glu Tyr Tyr Lys Asp
690 695 700

Cys
705

<210> 702

<211> 706

<212> PRT

<213> Artificial Sequence

<220><223> HIV B gag/nef fusion Epigraph 2

<400> 702

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Asn Ser
115 120 125
Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met
130 135 140
Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val
145 150 155 160

Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala
165 170 175
Leu Ser Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr
180 185 190
Ile Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn
195 200 205
Glu Glu Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro
210 215 220

Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240
Thr Thr Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn Pro
245 250 255
Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu
260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys
275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Arg
290 295 300
Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr
305 310 315 320
Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335
Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350

Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365
Met Ser Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn
370 375 380
Phe Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400
Gly His Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp
405 410 415

Lys Cys Gly Lys Glu Gly His Gln Met Lys Glu Cys Thr Glu Arg Gln
420 425 430
Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly
435 440 445
Asn Phe Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser
450 455 460
Phe Arg Phe Gly Glu Glu Thr Ala Thr Pro Pro Gln Lys Gln Glu Pro
465 470 475 480

Ile Asp Lys Glu Met Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly
485 490 495
Asn Asp Pro Ser Gln Gly Gly Lys Trp Ser Lys Arg Ser Val Pro Gly
500 505 510
Trp Asn Thr Ile Arg Glu Arg Met Arg Arg Thr Glu Pro Ala Ala Glu

515 520 525

Gly Val Gly Ala Ala Ser Arg Asp Leu Glu Arg His Gly Ala Ile Thr

530 535 540

Ser Ser Asn Thr Ala Ala Asn Asn Ala Ala Cys Ala Trp Leu Glu Ala

545 550 555 560

Gln Glu Asp Glu Glu Val Gly Phe Pro Val Lys Pro Gln Val Pro Leu

565 570 575

Arg Pro Met Thr Tyr Lys Ala Ala Val Asp Leu Ser His Phe Leu Lys

580 585 590

Glu Lys Gly Gly Leu Glu Gly Leu Ile His Ser Gln Lys Arg Gln Glu

595 600 605

Ile Leu Asp Leu Trp Val Tyr Asn Thr Gln Gly Tyr Phe Pro Asp Trp

610 615 620

His Asn Tyr Thr Pro Gly Pro Gly Thr Arg Phe Pro Leu Thr Phe Gly

625 630 635 640

Trp Cys Phe Lys Leu Val Pro Val Asp Pro Glu Gln Val Glu Lys Ala

645 650 655

Asn Glu Gly Glu Asn Asn Cys Leu Leu His Pro Met Ser Leu His Gly

660 665 670

Met Asp Asp Pro Glu Arg Glu Val Leu Val Trp Lys Phe Asp Ser Arg

675 680 685

Leu Ala Phe His His Val Ala Arg Glu Lys His Pro Glu Tyr Tyr Lys

690 695 700

Asp Cys

705

<210> 703

<211> 992

<212> PRT

<213> Artificial Sequence

<220><223> HIV B pol Epigraph 1

<400> 703

Met Phe Phe Arg Glu Asn Leu Ala Phe Pro Gln Gly Lys Ala Arg Glu

1 5 10 15

Phe Ser Ser Glu Gln Thr Arg Ala Asn Ser Pro Thr Arg Arg Glu Leu
20 25 30
Gln Val Trp Gly Arg Asp Asn Asn Ser Leu Ser Glu Ala Gly Ala Asp
35 40 45
Arg Gln Gly Thr Val Ser Phe Ser Phe Pro Gln Ile Thr Leu Trp Gln
50 55 60
Arg Pro Leu Val Thr Ile Lys Ile Gly Gly Gln Leu Lys Glu Ala Leu
65 70 75 80

Leu Ala Asp Asp Thr Val Leu Glu Glu Met Asn Leu Pro Gly Arg Trp
85 90 95
Lys Pro Lys Met Ile Gly Gly Ile Gly Gly Phe Ile Lys Val Arg Gln
100 105 110
Tyr Asp Gln Ile Pro Ile Glu Ile Cys Gly His Lys Ala Ile Gly Thr
115 120 125
Val Leu Val Gly Pro Thr Pro Val Asn Ile Ile Gly Arg Asn Leu Leu
130 135 140

Thr Gln Ile Gly Cys Thr Leu Asn Phe Pro Ile Ser Pro Ile Glu Thr
145 150 155 160
Val Pro Val Lys Leu Lys Pro Gly Met Asp Gly Pro Lys Val Lys Gln
165 170 175
Trp Pro Leu Thr Glu Glu Lys Ile Lys Ala Leu Val Glu Ile Cys Thr
180 185 190
Glu Met Glu Lys Glu Gly Lys Ile Ser Lys Ile Gly Pro Glu Asn Pro
195 200 205

Tyr Asn Thr Pro Val Phe Ala Ile Lys Lys Lys Asp Ser Thr Lys Trp
210 215 220
Arg Lys Leu Val Asp Phe Arg Glu Leu Asn Lys Arg Thr Gln Asp Phe
225 230 235 240
Trp Glu Val Gln Leu Gly Ile Pro His Pro Ala Gly Leu Lys Lys Lys
245 250 255

Lys Ser Val Thr Val Leu Asp Val Gly Asp Ala Tyr Phe Ser Val Pro
260 265 270

Leu Asp Lys Asp Phe Arg Lys Tyr Thr Ala Phe Thr Ile Pro Ser Ile
275 280 285

Asn Asn Glu Thr Pro Gly Ile Arg Tyr Gln Tyr Asn Val Leu Pro Gln
290 295 300

Gly Trp Lys Gly Ser Pro Ala Ile Phe Gln Ser Ser Met Thr Lys Ile
305 310 315 320

Leu Glu Pro Phe Arg Lys Gln Asn Pro Asp Ile Val Ile Tyr Gln Leu
325 330 335

Tyr Val Gly Ser Asp Leu Glu Ile Gly Gln His Arg Thr Lys Ile Glu
340 345 350

Glu Leu Arg Gln His Leu Leu Arg Trp Gly Phe Thr Thr Pro Asp Lys
355 360 365

Lys His Gln Lys Glu Pro Pro Phe Leu Trp Met Gly Tyr Glu Leu His
370 375 380

Pro Asp Lys Trp Thr Val Gln Pro Ile Val Leu Pro Glu Lys Asp Ser
385 390 395 400

Trp Thr Val Asn Asp Ile Gln Lys Leu Val Gly Lys Leu Asn Trp Ala
405 410 415

Ser Gln Ile Tyr Ala Gly Ile Lys Val Lys Gln Leu Cys Lys Leu Leu
420 425 430

Arg Gly Thr Lys Ala Leu Thr Glu Val Val Pro Leu Thr Glu Glu Ala
435 440 445

Glu Leu Glu Leu Ala Glu Asn Arg Glu Ile Leu Lys Glu Pro Val His
450 455 460

Gly Val Tyr Tyr Asp Pro Ser Lys Asp Leu Ile Ala Glu Ile Gln Lys
465 470 475 480

Gln Gly Gln Gly Gln Trp Thr Tyr Gln Ile Tyr Gln Glu Pro Phe Lys
485 490 495

Asn Leu Lys Thr Gly Lys Tyr Ala Arg Met Arg Gly Ala His Thr Asn

```
            500                 505                 510
Asp Val Lys Gln Leu Thr Glu Ala Val Gln Lys Ile Ala Thr Glu Ser
        515                 520                 525

Ile Val Ile Trp Gly Lys Thr Pro Lys Phe Lys Leu Pro Ile Gln Lys
    530                 535                 540
Glu Thr Trp Glu Ala Trp Trp Thr Glu Tyr Trp Gln Ala Thr Trp Ile
545                 550                 555                 560
Pro Glu Trp Glu Phe Val Asn Thr Pro Pro Leu Val Lys Leu Trp Tyr
                565                 570                 575
Gln Leu Glu Lys Glu Pro Ile Val Gly Ala Glu Thr Phe Tyr Val Asp
            580                 585                 590

Gly Ala Ala Asn Arg Glu Thr Lys Leu Gly Lys Ala Gly Tyr Val Thr
        595                 600                 605
Asp Arg Gly Arg Gln Lys Val Val Ser Leu Thr Asp Thr Thr Asn Gln
    610                 615                 620
Lys Thr Gln Ala Ile His Leu Ala Leu Gln Asp Ser Gly Leu Glu Val
625                 630                 635                 640
Asn Ile Val Thr Asp Ser Gln Tyr Ala Leu Gly Ile Ile Gln Ala Gln
                645                 650                 655

Pro Asp Lys Ser Glu Ser Glu Leu Val Ser Gln Ile Ile Glu Gln Leu
            660                 665                 670
Ile Lys Lys Glu Lys Val Tyr Leu Ala Trp Val Pro Ala His Lys Gly
        675                 680                 685
Ile Gly Gly Asn Glu Gln Val Asp Lys Leu Val Ser Ala Gly Ile Arg
    690                 695                 700
Lys Val Leu Phe Leu Asp Gly Ile Asp Lys Ala Gln Glu Glu His Glu
705                 710                 715                 720

Lys Tyr His Ser Asn Trp Arg Ala Met Ala Ser Asp Phe Asn Leu Pro
                725                 730                 735
Pro Val Val Ala Lys Glu Ile Val Ala Ser Cys Asp Lys Cys Gln Leu
            740                 745                 750
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Lys Gly Glu Ala Met His Gly Gln Val Asp Cys Ser Pro Gly Ile Trp
755 760 765
Gln Leu Cys Thr His Leu Glu Gly Lys Ile Ile Leu Val Ala Val His
770 775 780

Val Ala Ser Gly Tyr Ile Glu Ala Glu Val Ile Pro Ala Glu Thr Gly
785 790 795 800
Gln Glu Thr Ala Tyr Phe Leu Leu Lys Leu Ala Gly Arg Trp Pro Val
805 810 815
Lys Thr Ile His Thr Asn Gly Ser Asn Phe Thr Ser Thr Thr Val Lys
820 825 830
Ala Ala Cys Trp Trp Ala Gly Ile Lys Gln Glu Phe Gly Ile Pro Tyr
835 840 845

Asn Pro Gln Ser Gln Gly Val Val Ser Met Asn Lys Glu Leu Lys Lys
850 855 860
Ile Ile Gly Gln Val Arg Asp Gln Ala Glu His Leu Lys Thr Ala Val
865 870 875 880
Gln Met Ala Val Phe Ile His Asn Phe Lys Arg Lys Gly Gly Ile Gly
885 890 895
Gly Tyr Ser Ala Gly Glu Arg Ile Val Asp Ile Ile Ala Thr Asp Ile
900 905 910

Gln Thr Lys Glu Leu Gln Lys Gln Ile Thr Lys Ile Gln Asn Phe Arg
915 920 925
Val Tyr Tyr Arg Asp Ser Arg Asp Pro Leu Trp Lys Gly Pro Ala Lys
930 935 940
Leu Leu Trp Lys Gly Glu Gly Ala Val Val Ile Gln Asp Asn Ser Asp
945 950 955 960
Ile Lys Val Val Pro Arg Arg Lys Ala Lys Ile Ile Arg Asp Tyr Gly
965 970 975

Lys Gln Met Ala Gly Asp Asp Cys Val Ala Ser Arg Gln Asp Glu Asp
980 985 990

<210> 704

<211> 993

<212> PRT

<213> Artificial Sequence

<220><223> HIV B pol Epigraph 2

<400> 704

Met Phe Phe Arg Glu Asp Leu Ala Phe Pro Gln Gly Glu Ala Arg Glu
1 5 10 15

Phe Pro Ser Glu Gln Thr Arg Ala Asn Ser Pro Thr Ser Arg Glu Leu
20 25 30

Gln Val Trp Gly Gly Asp Asn Asn Ser Pro Ser Glu Ala Gly Ala Asp
35 40 45

Arg Gln Gly Thr Val Ser Leu Ser Phe Pro Gln Ile Thr Leu Trp Gln
50 55 60

Arg Pro Leu Val Thr Val Lys Ile Gly Gly Gln Leu Lys Glu Ala Leu
65 70 75 80

Leu Ala Asp Asp Thr Val Leu Glu Glu Met Ser Leu Pro Gly Lys Trp
85 90 95

Lys Pro Lys Met Ile Gly Gly Ile Gly Gly Phe Ile Lys Val Arg Gln
100 105 110

Tyr Asp Gln Val Pro Ile Glu Ile Cys Gly His Lys Thr Ile Gly Thr
115 120 125

Val Leu Ile Gly Pro Thr Pro Val Asn Ile Ile Gly Arg Asn Leu Leu
130 135 140

Thr Gln Leu Gly Cys Thr Leu Asn Phe Pro Ile Ser Pro Ile Glu Thr
145 150 155 160

Val Pro Val Lys Leu Lys Pro Gly Met Asp Gly Pro Arg Val Lys Gln
165 170 175

Trp Pro Leu Thr Glu Glu Lys Ile Lys Ala Leu Ile Glu Ile Cys Thr
180 185 190

Glu Met Glu Lys Glu Gly Lys Ile Ser Arg Ile Gly Pro Glu Asn Pro
195 200 205

Tyr Asn Thr Pro Ile Phe Ala Ile Lys Lys Lys Asp Ser Thr Lys Trp

210 215 220

Arg Lys Leu Val Asp Phe Arg Glu Leu Asn Lys Lys Thr Gln Asp Phe
225 230 235 240
Trp Glu Val Gln Leu Gly Ile Pro His Pro Ser Gly Leu Lys Lys Lys
245 250 255
Lys Ser Val Thr Val Leu Asp Val Gly Asp Ala Tyr Phe Ser Val Pro
260 265 270
Leu Asp Lys Glu Phe Arg Lys Tyr Thr Ala Phe Thr Ile Pro Ser Thr
275 280 285

Asn Asn Glu Thr Pro Gly Ile Arg Tyr Gln Tyr Asn Val Leu Pro Gln
290 295 300
Gly Trp Lys Gly Ser Pro Ala Ile Phe Gln Cys Ser Met Thr Lys Ile
305 310 315 320
Leu Glu Pro Phe Arg Lys Gln Asn Pro Glu Ile Val Ile Tyr Gln Leu
325 330 335
Tyr Val Gly Ser Asp Leu Glu Ile Gly Gln His Arg Ala Lys Ile Glu
340 345 350

Glu Leu Arg Gln His Leu Leu Lys Trp Gly Phe Thr Thr Pro Asp Lys
355 360 365
Lys His Gln Lys Glu Pro Pro Phe Leu Trp Met Gly Tyr Glu Leu His
370 375 380
Pro Asp Lys Trp Thr Val Gln Pro Ile Glu Leu Pro Glu Lys Asp Ser
385 390 395 400
Trp Thr Val Asn Asp Ile Gln Lys Leu Val Gly Lys Leu Asn Trp Ala
405 410 415

Ser Gln Ile Tyr Pro Gly Ile Lys Val Arg Gln Leu Cys Lys Leu Leu
420 425 430
Arg Gly Ala Lys Ala Leu Thr Glu Val Ile Pro Leu Thr Lys Glu Ala
435 440 445
Glu Leu Glu Leu Ala Glu Asn Arg Glu Ile Leu Arg Glu Pro Val His
450 455 460

Gly Val Tyr Tyr Asp Pro Thr Lys Asp Leu Ile Ala Glu Ile Gln Lys
465 470 475 480

Gln Gly Leu Gly Gln Trp Thr Tyr Gln Ile Tyr Gln Glu Pro Phe Lys
485 490 495
Asn Leu Lys Thr Gly Lys Tyr Ala Arg Thr Arg Gly Ala His Thr Asn
500 505 510
Asp Val Arg Gln Leu Thr Glu Ala Val Gln Lys Ile Thr Thr Glu Ser
515 520 525
Ile Val Ile Trp Gly Lys Thr Pro Lys Phe Arg Leu Pro Ile Gln Lys
530 535 540

Glu Thr Trp Glu Thr Trp Trp Thr Glu Tyr Trp Gln Ala Thr Trp Ile
545 550 555 560
Pro Glu Trp Glu Phe Val Asn Thr Pro Pro Leu Val Lys Leu Trp Tyr
565 570 575
Gln Leu Glu Lys Glu Pro Ile Ile Gly Ala Glu Thr Phe Tyr Val Asp
580 585 590
Gly Ala Ser Asn Arg Glu Thr Lys Leu Gly Lys Ala Gly Tyr Val Thr
595 600 605

Asn Arg Gly Arg Gln Lys Val Ile Ser Leu Thr Asp Thr Thr Asn Gln
610 615 620
Lys Thr Leu Gln Ala Ile Tyr Leu Ala Leu Gln Asp Ser Gly Ser Glu
625 630 635 640
Val Asn Ile Val Thr Asp Ser Gln Tyr Ala Leu Gly Ile Ile Gln Ala
645 650 655
Gln Pro Asp Gln Ser Glu Ser Glu Leu Val Asn Gln Ile Ile Glu Gln
660 665 670

Leu Ile Asn Lys Glu Lys Val Tyr Leu Ala Trp Val Pro Ala His Lys
675 680 685
Gly Ile Gly Gly Asn Glu Gln Val Asp Lys Leu Val Ser Thr Gly Ile
690 695 700
Arg Lys Val Leu Phe Leu Asp Gly Ile Asp Arg Ala Gln Glu Glu His

705 710 715 720

Glu Lys Tyr His Asn Asn Trp Arg Ala Met Ala Ser Asp Phe Asn Leu

725 730 735

Pro Pro Ile Val Ala Lys Glu Ile Val Ala Ser Cys Asp Lys Cys Gln

740 745 750

Leu Lys Gly Glu Ala Ile His Gly Gln Val Asp Cys Ser Pro Gly Ile

755 760 765

Trp Gln Leu Cys Thr His Leu Glu Gly Lys Val Ile Leu Val Ala Val

770 775 780

His Val Ala Ser Gly Tyr Ile Glu Ala Glu Val Ile Pro Ala Glu Thr

785 790 795 800

Gly Gln Glu Thr Ala Tyr Phe Ile Leu Lys Leu Ala Gly Arg Trp Pro

805 810 815

Val Lys Thr Val His Thr Asn Gly Ser Asn Phe Thr Ser Ala Thr Val

820 825 830

Lys Ala Ala Cys Trp Trp Ala Gly Val Lys Gln Glu Phe Gly Ile Pro

835 840 845

Tyr Asn Pro Gln Ser Gln Gly Val Val Ser Met Asn Asn Glu Leu Lys

850 855 860

Lys Ile Ile Gly Gln Ile Arg Asp Gln Ala Glu His Leu Lys Thr Ala

865 870 875 880

Val Gln Met Ala Val Phe Ile His Asn Phe Lys Arg Lys Gly Gly Ile

885 890 895

Gly Glu Tyr Ser Ala Gly Glu Arg Ile Ile Asp Ile Ile Ala Thr Asp

900 905 910

Ile Gln Thr Arg Glu Leu Gln Lys Gln Ile Thr Lys Ile Gln Asn Phe

915 920 925

Arg Val Tyr Tyr Arg Asp Asn Arg Asp Pro Leu Trp Lys Gly Pro Ala

930 935 940

Lys Leu Leu Trp Lys Gly Glu Gly Ala Val Val Ile Gln Asp Asn Ser

945 950 955 960

Glu Ile Lys Val Val Pro Arg Arg Lys Val Lys Ile Ile Arg Asp Tyr
965 970 975
Gly Lys Gln Met Ala Gly Asp Asp Cys Val Ala Gly Arg Gln Asp Glu
980 985 990

Asp

<210> 705
<211> 704
<212> PRT
<213> Artificial Sequence
<220><223> HIV M gag/nef fusion Epigraph 1
<400> 705
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Ala Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30
His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255
Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Lys
370 375 380
Gly Gln Lys Arg Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile
385 390 395 400
Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415

Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe
420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu
435 440 445

Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe
450 455 460

Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp Lys
465 470 475 480

Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro
485 490 495

Leu Ser Gln Gly Gly Lys Trp Ser Lys Ser Ser Ile Val Gly Trp Pro
500 505 510

Ala Val Arg Glu Arg Met Arg Arg Ala Glu Pro Ala Ala Glu Gly Val
515 520 525

Gly Ala Val Ser Arg Asp Leu Glu Lys His Gly Ala Ile Thr Ser Ser
530 535 540

Asn Thr Ala Ala Thr Asn Ala Asp Cys Ala Trp Leu Glu Ala Gln Glu
545 550 555 560

Glu Glu Glu Val Gly Phe Pro Val Arg Pro Gln Val Pro Leu Arg Pro
565 570 575

Met Thr Tyr Lys Gly Ala Leu Asp Leu Ser His Phe Leu Lys Glu Lys
580 585 590

Gly Gly Leu Glu Gly Leu Ile Tyr Ser Lys Lys Arg Gln Glu Ile Leu
595 600 605

Asp Leu Trp Val Tyr His Thr Gln Gly Tyr Phe Pro Asp Trp Gln Asn
610 615 620

Tyr Thr Pro Gly Pro Gly Ile Arg Tyr Pro Leu Thr Phe Gly Trp Cys
625 630 635 640

Phe Lys Leu Val Pro Val Asp Pro Arg Glu Val Glu Glu Ala Asn Glu
645 650 655

Gly Glu Asn Asn Cys Leu Leu His Pro Met Ser Gln His Gly Met Asp
660 665 670

Asp Pro Glu Lys Glu Val Leu Met Trp Lys Phe Asp Ser Arg Leu Ala
675 680 685

Phe His His Met Ala Arg Glu Leu His Pro Glu Tyr Tyr Lys Asp Cys
690 695 700

<210> 706

<211> 314

<212> PRT

<213> Artificial Sequence

<220><223> HIV M gag/nef conserved Epigraph 1

<400> 706

Met Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln Ala Ile
1 5 10 15

Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys Ala
20 25 30

Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu Gly Ala
35 40 45

Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His Gln
50 55 60

Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu
65 70 75 80

Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala Pro Gly Gln
85 90 95

Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu
100 105 110

Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro Val Gly
115 120 125

Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg
130 135 140

Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu

145 150 155 160

Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu
165 170 175
Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val
180 185 190
Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro
195 200 205
Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly
210 215 220

Pro Gly His Lys Ala Arg Val Leu Val Gly Phe Pro Val Arg Pro Gln
225 230 235 240
Val Pro Leu Arg Pro Met Thr Tyr Lys Gly Ala Leu Asp Leu Ser His
245 250 255
Phe Leu Lys Glu Lys Gly Gly Leu Glu Gly Leu Ile Tyr Ser Lys Lys
260 265 270
Arg Gln Glu Ile Leu Asp Leu Trp Val Tyr His Thr Gln Gly Tyr Phe
275 280 285

Pro Asp Trp Gln Asn Tyr Thr Pro Gly Pro Gly Ile Arg Tyr Pro Leu
290 295 300
Thr Phe Gly Trp Cys Phe Lys Leu Val Pro
305 310

<210> 707
<211> 701
<212> PRT
<213> Artificial Sequence
<220><223> HIV M gag/nef fusion Epigraph 2
<400> 707
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ala Glu Gly Cys Gln Gln Ile Ile Glu Gln Leu
50 55 60
Gln Ser Thr Leu Lys Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Gln
100 105 110
Gln Lys Thr Gln Gln Ala Ala Ala Gly Thr Gly Ser Ser Ser Lys Val
115 120 125
Ser Gln Asn Tyr Pro Ile Val Gln Asn Ala Gln Gly Gln Met Val His
130 135 140
Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Met Met Leu Asn Ile Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Pro

210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile
245 250 255
Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Asp Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Arg Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Asn Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Asn Lys Gly Arg Pro Gly Asn Phe

435 440 445

Pro Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg

450 455 460

Phe Glu Glu Thr Thr Pro Ala Pro Lys Gln Glu Pro Lys Asp Arg Glu

465 470 475 480

Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Ser Asp Pro Leu Ser Gln

485 490 495

Gly Ser Lys Trp Ser Lys Ser Ser Ile Val Gly Trp Pro Ala Ile Arg

500 505 510

Glu Arg Met Arg Arg Thr Glu Pro Ala Ala Glu Gly Val Gly Ala Ala

515 520 525

Ser Arg Asp Leu Glu Arg His Gly Ala Ile Thr Ser Ser Asn Thr Ala

530 535 540

Ala Asn Asn Ala Asp Cys Ala Trp Leu Glu Ala Gln Glu Asp Glu Glu

545 550 555 560

Val Gly Phe Pro Val Lys Pro Gln Val Pro Leu Arg Pro Met Thr Tyr

565 570 575

Lys Ala Ala Phe Asp Leu Ser Phe Phe Leu Lys Glu Lys Gly Gly Leu

580 585 590

Asp Gly Leu Ile Tyr Ser Gln Lys Arg Gln Asp Ile Leu Asp Leu Trp

595 600 605

Val Tyr Asn Thr Gln Gly Phe Phe Pro Asp Trp Gln Asn Tyr Thr Pro

610 615 620

Gly Pro Gly Val Arg Tyr Pro Leu Thr Phe Gly Trp Cys Phe Lys Leu

625 630 635 640

Val Pro Val Glu Pro Glu Lys Val Glu Glu Ala Asn Glu Gly Glu Asn

645 650 655

Asn Ser Leu Leu His Pro Met Ser Leu His Gly Met Asp Asp Pro Glu

660 665 670

Arg Glu Val Leu Met Trp Lys Phe Asp Ser Ser Leu Ala Arg Arg His

675 680 685

Met Ala Arg Glu Leu His Pro Glu Phe Tyr Lys Asp Cys

690 695 700

<210> 708

<211> 314

<212> PRT

<213> Artificial Sequence

<220><223> HIV M gag/nef conserved Epigraph 2

<400> 708

Met Pro Ile Val Gln Asn Ala Gln Gly Gln Met Val His Gln Pro Leu

1 5 10 15

Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys Ala

20 25 30

Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser Glu Gly Ala

35 40 45

Thr Pro Gln Asp Leu Asn Met Met Leu Asn Ile Val Gly Gly His Gln

50 55 60

Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu Ala Ala Glu

65 70 75 80

Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Pro Pro Gly Gln

85 90 95

Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Asn Leu

100 105 110

Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile Pro Val Gly

115 120 125

Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg

130 135 140

Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly Pro Lys Glu

145 150 155 160

Pro Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys Thr Leu Arg Ala Glu

165 170 175

Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Asp Thr Leu Leu Val

180 185 190

Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Arg Ala Leu Gly Pro

195 200 205

Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly

210 215 220

Pro Ser His Lys Ala Arg Val Leu Val Gly Phe Pro Val Lys Pro Gln

225 230 235 240

Val Pro Leu Arg Pro Met Thr Tyr Lys Ala Ala Phe Asp Leu Ser Phe

245 250 255

Phe Leu Lys Glu Lys Gly Gly Leu Asp Gly Leu Ile Tyr Ser Gln Lys

260 265 270

Arg Gln Asp Ile Leu Asp Leu Trp Val Tyr Asn Thr Gln Gly Phe Phe

275 280 285

Pro Asp Trp Gln Asn Tyr Thr Pro Gly Pro Gly Val Arg Tyr Pro Leu

290 295 300

Thr Phe Gly Trp Cys Phe Lys Leu Val Pro

305 310

<210> 709

<211> 994

<212> PRT

<213> Artificial Sequence

<220><223> HIV M pol Epigraph 1

<400> 709

Met Phe Phe Arg Glu Asn Leu Ala Phe Pro Gln Gly Glu Ala Arg Glu

1 5 10 15

Phe Ser Ser Glu Gln Thr Arg Ala Asn Ser Pro Thr Arg Arg Glu Leu

20 25 30

Gln Val Trp Gly Arg Asp Asn Asn Ser Leu Ser Glu Ala Gly Ala Asp

35 40 45

Arg Gln Gly Thr Val Ser Phe Ser Phe Pro Gln Ile Thr Leu Trp Gln

50 55 60

Arg Pro Leu Val Thr Ile Lys Ile Gly Gly Gln Leu Lys Glu Ala Leu

65 70 75 80

Leu Ala Asp Asp Thr Val Leu Glu Asp Ile Asn Leu Pro Gly Lys Trp

85 90 95

Lys Pro Lys Met Ile Gly Gly Ile Gly Gly Phe Ile Lys Val Arg Gln

100 105 110

Tyr Asp Gln Ile Leu Ile Glu Ile Cys Gly Lys Lys Ala Ile Gly Thr

115 120 125

Val Leu Val Gly Pro Thr Pro Val Asn Ile Ile Gly Arg Asn Leu Leu

130 135 140

Thr Gln Ile Gly Cys Thr Leu Asn Phe Pro Ile Ser Pro Ile Glu Thr

145 150 155 160

Val Pro Val Lys Leu Lys Pro Gly Met Asp Gly Pro Lys Val Lys Gln
165 170 175
Trp Pro Leu Thr Glu Glu Lys Ile Lys Ala Leu Val Glu Ile Cys Thr
180 185 190
Glu Met Glu Lys Glu Gly Lys Ile Ser Lys Ile Gly Pro Glu Asn Pro

195 200 205
Tyr Asn Thr Pro Val Phe Ala Ile Lys Lys Lys Asp Ser Thr Lys Trp
210 215 220
Arg Lys Leu Val Asp Phe Arg Glu Leu Asn Lys Arg Thr Gln Asp Phe
225 230 235 240
Trp Glu Val Gln Leu Gly Ile Pro His Pro Ala Gly Leu Lys Lys Lys
245 250 255
Lys Ser Val Thr Val Leu Asp Val Gly Asp Ala Tyr Phe Ser Val Pro

260 265 270
Leu Asp Lys Asp Phe Arg Lys Tyr Thr Ala Phe Thr Ile Pro Ser Ile
275 280 285
Asn Asn Glu Thr Pro Gly Ile Arg Tyr Gln Tyr Asn Val Leu Pro Gln
290 295 300
Gly Trp Lys Gly Ser Pro Ala Ile Phe Gln Ser Ser Met Thr Lys Ile
305 310 315 320
Leu Glu Pro Phe Arg Lys Gln Asn Pro Asp Ile Val Ile Tyr Gln Leu

325 330 335
Tyr Val Gly Ser Asp Leu Glu Ile Gly Gln His Arg Thr Lys Ile Glu
340 345 350
Glu Leu Arg Gln His Leu Leu Lys Trp Gly Phe Thr Thr Pro Asp Lys
355 360 365
Lys His Gln Lys Glu Pro Pro Phe Leu Trp Met Gly Tyr Glu Leu His
370 375 380
Pro Asp Lys Trp Thr Val Gln Pro Ile Val Leu Pro Glu Lys Asp Ser

385 390 395 400
Trp Thr Val Asn Asp Ile Gln Lys Leu Val Gly Lys Leu Asn Trp Ala

405 410 415

Ser Gln Ile Tyr Pro Gly Ile Lys Val Lys Gln Leu Cys Lys Leu Leu

420 425 430

Arg Gly Ala Lys Ala Leu Thr Asp Ile Val Pro Leu Thr Glu Glu Ala

435 440 445

Glu Leu Glu Leu Ala Glu Asn Arg Glu Ile Leu Lys Glu Pro Val His

450 455 460

Gly Val Tyr Tyr Asp Pro Ser Lys Asp Leu Ile Ala Glu Ile Gln Lys

465 470 475 480

Gln Gly Gln Asp Gln Trp Thr Tyr Gln Ile Tyr Gln Glu Pro Phe Lys

485 490 495

Asn Leu Lys Thr Gly Lys Tyr Ala Arg Met Arg Gly Ala His Thr Asn

500 505 510

Asp Val Lys Gln Leu Thr Glu Ala Val Gln Lys Ile Ala Thr Glu Ser

515 520 525

Ile Val Ile Trp Gly Lys Thr Pro Lys Phe Arg Leu Pro Ile Gln Lys

530 535 540

Glu Thr Trp Glu Thr Trp Trp Thr Glu Tyr Trp Gln Ala Thr Trp Ile

545 550 555 560

Pro Glu Trp Glu Phe Val Asn Thr Pro Pro Leu Val Lys Leu Trp Tyr

565 570 575

Gln Leu Glu Lys Glu Pro Ile Val Gly Ala Glu Thr Phe Tyr Val Asp

580 585 590

Gly Ala Ala Asn Arg Glu Thr Lys Leu Gly Lys Ala Gly Tyr Val Thr

595 600 605

Asp Arg Gly Arg Gln Lys Val Val Ser Leu Thr Glu Thr Thr Asn Gln

610 615 620

Lys Thr Leu Gln Ala Ile His Leu Ala Leu Gln Asp Ser Gly Ser Glu

625 630 635 640

Val Asn Ile Val Thr Asp Ser Gln Tyr Ala Leu Gly Ile Ile Gln Ala

645 650 655

Gln Pro Asp Lys Ser Glu Ser Glu Leu Val Asn Gln Ile Ile Glu Gln
660 665 670
Leu Ile Lys Lys Glu Lys Val Tyr Leu Ser Trp Val Pro Ala His Lys
675 680 685
Gly Ile Gly Gly Asn Glu Gln Val Asp Lys Leu Val Ser Ser Gly Ile
690 695 700
Arg Lys Val Leu Phe Leu Asp Gly Ile Asp Lys Ala Gln Glu Glu His

705 710 715 720
Glu Lys Tyr His Ser Asn Trp Arg Ala Met Ala Ser Asp Phe Asn Leu
725 730 735
Pro Pro Ile Val Ala Lys Glu Ile Val Ala Ser Cys Asp Lys Cys Gln
740 745 750
Leu Lys Gly Glu Ala Met His Gly Gln Val Asp Cys Ser Pro Gly Ile
755 760 765
Trp Gln Leu Cys Thr His Leu Glu Gly Lys Val Ile Leu Val Ala Val

770 775 780
His Val Ala Ser Gly Tyr Ile Glu Ala Glu Val Ile Pro Ala Glu Thr
785 790 795 800
Gly Gln Glu Thr Ala Tyr Phe Leu Leu Lys Leu Ala Gly Arg Trp Pro
805 810 815
Val Lys Val Ile His Thr Asn Gly Ser Asn Phe Thr Ser Ala Ala Val
820 825 830
Lys Ala Ala Cys Trp Trp Ala Gly Ile Lys Gln Glu Phe Gly Ile Pro

835 840 845
Tyr Asn Pro Gln Ser Gln Gly Val Val Ser Met Asn Lys Glu Leu Lys
850 855 860
Lys Ile Ile Gly Gln Val Arg Asp Gln Ala Glu His Leu Lys Thr Ala
865 870 875 880
Val Gln Met Ala Val Phe Ile His Asn Phe Lys Arg Lys Gly Gly Ile
885 890 895
Gly Gly Tyr Ser Ala Gly Glu Arg Ile Ile Asp Ile Ile Ala Thr Asp

900 905 910

Ile Gln Thr Lys Glu Leu Gln Lys Gln Ile Thr Lys Ile Gln Asn Phe

915 920 925

Arg Val Tyr Tyr Arg Asp Ser Arg Asp Pro Ile Trp Lys Gly Pro Ala

930 935 940

Lys Leu Leu Trp Lys Gly Glu Gly Ala Val Val Ile Gln Asp Asn Ser

945 950 955 960

Asp Ile Lys Val Val Pro Arg Arg Lys Ala Lys Ile Ile Arg Asp Tyr

965 970 975

Gly Lys Gln Met Ala Gly Asp Asp Cys Val Ala Gly Arg Gln Asp Glu

980 985 990

Asp Gln

<210> 710

<211> 599

<212> PRT

<213> Artificial Sequence

<220><223> HIV M pol conserved Epigraph 1

<400> 710

Met Pro Gln Ile Thr Leu Trp Gln Arg Pro Leu Val Thr Ile Lys Ile

1 5 10 15

Gly Gly Gln Leu Lys Glu Ala Leu Leu Ala Asp Asp Thr Val Leu Glu

20 25 30

Asp Ile Asn Leu Pro Gly Lys Trp Lys Pro Lys Met Ile Gly Gly Ile

35 40 45

Gly Gly Phe Ile Lys Val Arg Gln Tyr Asp Gln Ile Leu Ile Glu Ile

50 55 60

Cys Gly Lys Lys Ala Ile Gly Thr Val Leu Val Gly Pro Thr Pro Val

65 70 75 80

Asn Ile Ile Gly Arg Asn Leu Leu Thr Gln Ile Gly Cys Thr Leu Asn

85 90 95

Phe Pro Ile Ser Pro Ile Glu Thr Val Pro Val Lys Leu Lys Pro Gly

100 105 110

Met Asp Gly Pro Lys Val Lys Gln Trp Pro Leu Thr Glu Glu Lys Ile

115 120 125

Lys Ala Leu Val Glu Ile Cys Thr Glu Met Glu Lys Glu Gly Lys Ile

130 135 140

Ser Lys Ile Gly Pro Glu Asn Pro Tyr Asn Thr Pro Val Phe Ala Ile

145 150 155 160

Lys Lys Lys Asp Ser Thr Lys Trp Arg Lys Leu Val Asp Phe Arg Glu

165 170 175

Leu Asn Lys Arg Thr Gln Asp Phe Trp Glu Val Gln Leu Gly Ile Pro

180 185 190

His Pro Ala Gly Leu Lys Lys Lys Lys Ser Val Thr Val Leu Asp Val

195 200 205

Gly Asp Ala Tyr Phe Ser Val Pro Leu Asp Lys Asp Phe Arg Lys Tyr

210 215 220

Thr Ala Phe Thr Ile Pro Ser Ile Asn Asn Glu Thr Pro Gly Ile Arg

225 230 235 240

Tyr Gln Tyr Asn Val Leu Pro Gln Gly Trp Lys Gly Ser Pro Ala Ile

245 250 255

Phe Gln Ser Ser Met Thr Lys Ile Leu Glu Pro Phe Arg Lys Gln Asn

260 265 270

Pro Asp Ile Val Ile Tyr Gln Leu Tyr Val Gly Ser Asp Leu Glu Ile

275 280 285

Gly Gln His Arg Thr Lys Ile Glu Glu Leu Arg Gln His Leu Leu Lys

290 295 300

Trp Gly Phe Thr Thr Pro Asp Lys Lys His Gln Lys Glu Pro Pro Phe

305 310 315 320

Leu Trp Met Gly Tyr Glu Leu His Pro Asp Lys Trp Thr Val Gln Pro

325 330 335

Ile Val Leu Pro Glu Lys Asp Ser Trp Thr Val Asn Asp Ile Gln Lys

340 345 350

Leu Val Gly Lys Leu Asn Trp Ala Ser Gln Ile Tyr His Gly Gln Val
355 360 365

Asp Cys Ser Pro Gly Ile Trp Gln Leu Cys Thr His Leu Glu Gly Lys
370 375 380

Val Ile Leu Val Ala Val His Val Ala Ser Gly Tyr Ile Glu Ala Glu
385 390 395 400

Val Ile Pro Ala Glu Thr Gly Gln Glu Thr Ala Tyr Phe Leu Leu Lys

405 410 415

Leu Ala Gly Arg Trp Pro Val Lys Val Ile His Thr Asn Gly Ser Asn
420 425 430

Phe Thr Ser Ala Ala Val Lys Ala Ala Cys Trp Trp Ala Gly Ile Lys
435 440 445

Gln Glu Phe Gly Ile Pro Tyr Asn Pro Gln Ser Gln Gly Val Val Ser
450 455 460

Met Asn Lys Glu Leu Lys Lys Ile Ile Gly Gln Val Arg Asp Gln Ala

465 470 475 480

Glu His Leu Lys Thr Ala Val Gln Met Ala Val Phe Ile His Asn Phe

485 490 495

Lys Arg Lys Gly Gly Ile Gly Gly Tyr Ser Ala Gly Glu Arg Ile Ile
500 505 510

Asp Ile Ile Ala Thr Asp Ile Gln Thr Lys Leu Gln Lys Gln Ile Thr
515 520 525

Lys Ile Gln Asn Phe Arg Val Tyr Tyr Arg Asp Ser Arg Asp Pro Ile

530 535 540

Trp Lys Gly Pro Ala Lys Leu Leu Trp Lys Gly Glu Gly Ala Val Val
545 550 555 560

Ile Gln Asp Asn Ser Asp Ile Lys Val Val Pro Arg Arg Lys Ala Lys

565 570 575

Ile Ile Arg Asp Tyr Gly Lys Gln Met Ala Gly Asp Asp Cys Val Ala
580 585 590

Gly Arg Gln Asp Glu Asp Gln

595

<210> 711

<211> 993

<212> PRT

<213> Artificial Sequence

<220><223> HIV M pol Epigraph 2

<400> 711

Met Phe Phe Arg Glu Asp Leu Ala Phe Pro Gln Gly Lys Ala Arg Glu
1 5 10 15

Phe Pro Ser Glu Gln Thr Arg Ala Asn Ser Pro Thr Arg Gly Glu Leu
20 25 30

Gln Val Trp Gly Gly Asp Asn Asn Ser Pro Ser Glu Ala Gly Ala Asp
35 40 45

Arg Gln Gly Thr Val Ser Phe Ser Phe Pro Gln Ile Thr Leu Trp Gln
50 55 60

Arg Pro Leu Val Ser Ile Lys Val Gly Gly Gln Ile Lys Glu Ala Leu
65 70 75 80

Leu Ala Asp Asp Thr Val Leu Glu Glu Met Asn Leu Pro Gly Arg Trp
85 90 95

Lys Pro Lys Met Ile Gly Gly Ile Gly Gly Phe Ile Lys Val Arg Gln
100 105 110

Tyr Asp Gln Ile Pro Ile Glu Ile Cys Gly His Lys Ala Ile Gly Thr
115 120 125

Val Leu Ile Gly Pro Thr Pro Val Asn Ile Ile Gly Arg Asn Met Leu
130 135 140

Thr Gln Leu Gly Cys Thr Leu Asn Phe Pro Ile Ser Pro Ile Asp Thr
145 150 155 160

Val Pro Val Thr Leu Lys Pro Gly Met Asp Gly Pro Arg Val Lys Gln
165 170 175

Trp Pro Leu Thr Glu Glu Lys Ile Lys Ala Leu Thr Glu Ile Cys Lys
180 185 190

Glu Met Glu Lys Glu Gly Lys Ile Thr Lys Ile Gly Pro Glu Asn Pro
195 200 205
Tyr Asn Thr Pro Ile Phe Ala Ile Lys Lys Lys Asp Ser Thr Lys Trp
210 215 220
Arg Lys Leu Val Asp Phe Arg Glu Leu Asn Lys Lys Thr Gln Asp Phe
225 230 235 240

Trp Glu Val Gln Leu Gly Ile Pro His Pro Ala Gly Leu Lys Lys Lys
245 250 255
Lys Ser Val Thr Val Leu Asp Val Gly Asp Ala Tyr Phe Ser Val Pro
260 265 270
Leu Asp Glu Ser Phe Arg Lys Tyr Thr Ala Phe Thr Ile Pro Ser Thr
275 280 285
Asn Asn Glu Thr Pro Gly Ile Arg Tyr Gln Tyr Asn Val Leu Pro Gln
290 295 300

Gly Trp Lys Gly Ser Pro Ala Ile Phe Gln Cys Ser Met Thr Lys Ile
305 310 315 320
Leu Glu Pro Phe Arg Ile Lys Asn Pro Glu Ile Val Ile Tyr Gln Leu
325 330 335
Tyr Val Gly Ser Asp Leu Glu Ile Gly Gln His Arg Ala Lys Ile Glu
340 345 350
Glu Leu Arg Glu His Leu Leu Arg Trp Gly Phe Thr Thr Pro Asp Lys
355 360 365

Lys His Gln Lys Glu Pro Pro Phe Leu Trp Met Gly Tyr Glu Leu His
370 375 380
Pro Asp Arg Trp Thr Val Gln Pro Ile Glu Leu Pro Glu Lys Asp Ser
385 390 395 400
Trp Thr Val Asn Asp Ile Gln Lys Leu Val Gly Lys Leu Asn Trp Ala
405 410 415
Ser Gln Ile Tyr Ala Gly Ile Lys Val Arg Gln Leu Cys Lys Leu Leu
420 425 430

Arg Gly Thr Lys Ala Leu Thr Glu Val Val Pro Leu Thr Glu Glu Ala

435 440 445

Glu Leu Glu Leu Ala Glu Asn Arg Glu Ile Leu Lys Thr Pro Val His

450 455 460

Gly Val Tyr Tyr Asp Pro Ser Lys Asp Leu Val Ala Glu Ile Gln Lys

465 470 475 480

Gln Gly Gln Gly Gln Trp Thr Tyr Gln Ile Tyr Gln Glu Pro Tyr Lys

485 490 495

Asn Leu Lys Thr Gly Lys Tyr Ala Arg Lys Arg Ser Ala His Thr Asn

500 505 510

Asp Val Arg Gln Leu Thr Glu Val Val Gln Lys Ile Ala Thr Glu Ser

515 520 525

Ile Val Ile Trp Gly Lys Thr Pro Lys Phe Lys Leu Pro Ile Gln Lys

530 535 540

Glu Thr Trp Glu Ala Trp Trp Thr Asp Tyr Trp Gln Ala Thr Trp Ile

545 550 555 560

Pro Asp Trp Glu Phe Val Asn Thr Pro Pro Leu Val Lys Leu Trp Tyr

565 570 575

Gln Leu Glu Lys Asp Pro Ile Val Gly Ala Glu Thr Phe Tyr Val Asp

580 585 590

Gly Ala Ala Ser Arg Glu Thr Lys Leu Gly Lys Ala Gly Tyr Val Thr

595 600 605

Asn Arg Gly Arg Gln Lys Val Val Ser Leu Thr Asp Thr Thr Asn Gln

610 615 620

Lys Thr Leu His Ala Ile His Leu Ala Leu Gln Asp Ser Gly Leu Glu

625 630 635 640

Val Asn Ile Val Thr Asp Ser Gln Tyr Ala Leu Gly Ile Ile Gln Ala

645 650 655

Gln Pro Asp Arg Ser Glu Ser Glu Val Val Asn Gln Ile Ile Glu Glu

660 665 670

Leu Ile Lys Lys Glu Lys Val Tyr Leu Ala Trp Val Pro Ala His Lys

675 680 685

Gly Ile Gly Gly Asn Glu Gln Val Asp Lys Leu Val Ser Ala Gly Ile
690 695 700

Arg Lys Val Leu Phe Leu Asp Gly Ile Asp Lys Ala Gln Glu Glu His
705 710 715 720

Glu Arg Tyr His Ser Asn Trp Arg Thr Met Ala Ser Asp Phe Asn Leu
725 730 735

Pro Pro Val Val Ala Lys Glu Ile Val Ala Asn Cys Asp Lys Cys Gln
740 745 750

Leu Lys Gly Glu Ala Ile His Gly Gln Val Asp Cys Ser Pro Gly Met
755 760 765

Trp Gln Leu Cys Thr His Leu Glu Gly Lys Ile Ile Leu Val Ala Val
770 775 780

His Val Ala Ser Gly Tyr Met Glu Ala Glu Val Ile Pro Ala Glu Thr
785 790 795 800

Gly Gln Glu Thr Ala Tyr Phe Ile Leu Lys Leu Ala Gly Arg Trp Pro
805 810 815

Val Lys Thr Ile His Thr Asn Gly Ser Asn Phe Thr Ser Thr Thr Val
820 825 830

Lys Ala Ala Cys Trp Trp Ala Gly Ile Gln Gln Glu Phe Gly Ile Pro
835 840 845

Tyr Asn Pro Gln Ser Gln Gly Val Val Ser Met Asn Asn Glu Leu Lys
850 855 860

Lys Ile Ile Gly Gln Val Arg Glu Gln Ala Glu His Leu Lys Thr Ala
865 870 875 880

Val Gln Met Ala Val Phe Ile His Asn Phe Lys Arg Arg Gly Gly Ile
885 890 895

Gly Gly Tyr Ser Ala Gly Glu Arg Ile Val Asp Ile Ile Ala Thr Asp
900 905 910

Ile Gln Thr Arg Glu Leu Gln Lys Gln Ile Ile Lys Ile Gln Asn Phe
915 920 925

Arg Val Tyr Tyr Arg Asp Ser Arg Asp Pro Leu Trp Lys Gly Pro Ala

930 935 940

Lys Leu Leu Trp Lys Gly Glu Gly Ala Val Val Ile Gln Asp Asn Ser
945 950 955 960
Glu Ile Lys Val Val Pro Arg Arg Lys Val Lys Ile Ile Lys Asp Tyr
965 970 975
Gly Lys Gln Met Ala Gly Asp Asp Cys Val Ala Ser Arg Gln Asp Glu
980 985 990
Asp

<210> 712
<211> 598
<212> PRT
<213> Artificial Sequence
<220><223> HIV M pol conserved Epigraph 2

<400> 712
Met Pro Gln Ile Thr Leu Trp Gln Arg Pro Leu Val Ser Ile Lys Val
1 5 10 15
Gly Gly Gln Ile Lys Glu Ala Leu Leu Ala Asp Asp Thr Val Leu Glu
20 25 30
Glu Met Asn Leu Pro Gly Arg Trp Lys Pro Lys Met Ile Gly Gly Ile
35 40 45
Gly Gly Phe Ile Lys Val Arg Gln Tyr Asp Gln Ile Pro Ile Glu Ile
50 55 60

Cys Gly His Lys Ala Ile Gly Thr Val Leu Ile Gly Pro Thr Pro Val
65 70 75 80
Asn Ile Ile Gly Arg Asn Met Leu Thr Gln Leu Gly Cys Thr Leu Asn
85 90 95
Phe Pro Ile Ser Pro Ile Asp Thr Val Pro Val Thr Leu Lys Pro Gly
100 105 110
Met Asp Gly Pro Arg Val Lys Gln Trp Pro Leu Thr Glu Glu Lys Ile
115 120 125

Lys Ala Leu Thr Glu Ile Cys Lys Glu Met Glu Lys Glu Gly Lys Ile
130 135 140
Thr Lys Ile Gly Pro Glu Asn Pro Tyr Asn Thr Pro Ile Phe Ala Ile
145 150 155 160
Lys Lys Lys Asp Ser Thr Lys Trp Arg Lys Leu Val Asp Phe Arg Glu
165 170 175
Leu Asn Lys Lys Thr Gln Asp Phe Trp Glu Val Gln Leu Gly Ile Pro
180 185 190

His Pro Ala Gly Leu Lys Lys Lys Lys Ser Val Thr Val Leu Asp Val
195 200 205
Gly Asp Ala Tyr Phe Ser Val Pro Leu Asp Glu Ser Phe Arg Lys Tyr
210 215 220
Thr Ala Phe Thr Ile Pro Ser Thr Asn Asn Glu Thr Pro Gly Ile Arg
225 230 235 240
Tyr Gln Tyr Asn Val Leu Pro Gln Gly Trp Lys Gly Ser Pro Ala Ile
245 250 255

Phe Gln Cys Ser Met Thr Lys Ile Leu Glu Pro Phe Arg Ile Lys Asn
260 265 270
Pro Glu Ile Val Ile Tyr Gln Leu Tyr Val Gly Ser Asp Leu Glu Ile
275 280 285
Gly Gln His Arg Ala Lys Ile Glu Glu Leu Arg Glu His Leu Leu Arg
290 295 300
Trp Gly Phe Thr Thr Pro Asp Lys Lys His Gln Lys Glu Pro Pro Phe
305 310 315 320

Leu Trp Met Gly Tyr Glu Leu His Pro Asp Arg Trp Thr Val Gln Pro
325 330 335
Ile Glu Leu Pro Glu Lys Asp Ser Trp Thr Val Asn Asp Ile Gln Lys
340 345 350
Leu Val Gly Lys Leu Asn Trp Ala Ser Gln Ile Tyr His Gly Gln Val
355 360 365
Asp Cys Ser Pro Gly Met Trp Gln Leu Cys Thr His Leu Glu Gly Lys

370 375 380

Ile Ile Leu Val Ala Val His Val Ala Ser Gly Tyr Met Glu Ala Glu
385 390 395 400
Val Ile Pro Ala Glu Thr Gly Gln Glu Thr Ala Tyr Phe Ile Leu Lys
405 410 415
Leu Ala Gly Arg Trp Pro Val Lys Thr Ile His Thr Asn Gly Ser Asn
420 425 430
Phe Thr Ser Thr Thr Val Lys Ala Ala Cys Trp Trp Ala Gly Ile Gln
435 440 445

Gln Glu Phe Gly Ile Pro Tyr Asn Pro Gln Ser Gln Gly Val Val Ser
450 455 460
Met Asn Asn Glu Leu Lys Lys Ile Ile Gly Gln Val Arg Glu Gln Ala
465 470 475 480
Glu His Leu Lys Thr Ala Val Gln Met Ala Val Phe Ile His Asn Phe
485 490 495
Lys Arg Arg Gly Gly Ile Gly Gly Tyr Ser Ala Gly Glu Arg Ile Val
500 505 510

Asp Ile Ile Ala Thr Asp Ile Gln Thr Arg Leu Gln Lys Gln Ile Ile
515 520 525
Lys Ile Gln Asn Phe Arg Val Tyr Tyr Arg Asp Ser Arg Asp Pro Leu
530 535 540
Trp Lys Gly Pro Ala Lys Leu Leu Trp Lys Gly Glu Gly Ala Val Val
545 550 555 560
Ile Gln Asp Asn Ser Glu Ile Lys Val Val Pro Arg Arg Lys Val Lys
565 570 575

Ile Ile Lys Asp Tyr Gly Lys Gln Met Ala Gly Asp Asp Cys Val Ala
580 585 590
Ser Arg Gln Asp Glu Asp
595
<210> 713
<211> 773

<212> PRT

<213> Artificial Sequence

<220><223> SIV gag/nef hybrid

<400> 713

Met Gly Ala Arg Gly Ser Val Leu Ser Gly Lys Lys Thr Asp Glu Leu
1 5 10 15

Glu Lys Val Arg Leu Arg Pro Gly Gly Arg Lys Lys Tyr Met Leu Lys
20 25 30

His Ile Val Trp Ala Ala Arg Glu Leu Asp Arg Phe Gly Ser Ala Glu
35 40 45

Ser Leu Leu Glu Ser Lys Glu Gly Cys Gln Arg Ile Leu Ala Val Leu
50 55 60

Ala Pro Leu Met Pro Thr Gly Ser Glu Asp Leu Lys Ser Leu Phe Ser
65 70 75 80

Thr Val Cys Val Val Trp Cys Leu His Ala Glu Met Lys Val Lys Asp
85 90 95

Thr Glu Glu Ala Lys Lys Thr Val Gln Ser His Leu Val Val Glu Ser
100 105 110

Gly Thr Ala Glu Thr Met Pro Ala Gln Ser Arg Pro Thr Ala Pro Pro
115 120 125

Ser Gly Arg Gly Gly Asn Tyr Pro Val Gln Gln Ile Gly Gly Asn Tyr
130 135 140

Val His Leu Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Leu
145 150 155 160

Ile Glu Glu Lys Lys Phe Gly Ala Glu Val Val Pro Gly Phe Gln Ala
165 170 175

Leu Ser Glu Gly Cys Thr Pro Tyr Asp Ile Asn Gln Met Leu Asn Cys
180 185 190

Val Gly Asp His Gln Ala Ala Met Gln Ile Ile Arg Asp Ile Ile Asn
195 200 205

Glu Glu Ala Ala Asp Trp Asp Leu Gln His Pro Gln Pro Ala Pro Gln

210 215 220

Gln Gly Gln Leu Arg Glu Pro Ser Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Ser Val Asp Glu Gln Ile Gln Trp Met Tyr Arg Gln Gln Asn Pro
245 250 255
Ile Pro Val Gly Asn Ile Tyr Arg Arg Trp Ile Gln Leu Gly Leu Gln
260 265 270
Lys Cys Val Arg Met Tyr Asn Pro Thr Asn Ile Leu Asp Val Lys Gln
275 280 285

Gly Pro Lys Glu Pro Phe Gln Ser Tyr Val Asp Arg Phe Tyr Lys Ser
290 295 300
Leu Arg Ala Glu Gln Thr Asp Ala Ala Val Lys Asn Trp Met Thr Gln
305 310 315 320
Thr Leu Leu Ile Gln Asn Ala Asn Pro Asp Cys Lys Leu Val Leu Lys
325 330 335
Gly Leu Gly Val Asn Pro Thr Leu Glu Glu Met Leu Thr Ala Cys Gln
340 345 350

Gly Val Gly Gly Pro Gly Gln Lys Ala Arg Leu Met Ala Glu Ala Leu
355 360 365
Lys Asp Ala Leu Thr Pro Gly Pro Ile Pro Phe Ala Ala Val Gln Gln
370 375 380
Arg Gly Gln Arg Lys Ile Ile Lys Cys Trp Asn Cys Gly Lys Thr Gly
385 390 395 400
His Ser Ala Arg Gln Cys Lys Ala Pro Arg Arg Lys Gly Cys Trp Lys
405 410 415

Cys Gly Lys Ala Gly His Val Met Ala Lys Cys Pro Glu Arg Gln Ala
420 425 430
Gly Phe Leu Gly Phe Gly Pro Trp Gly Lys Lys Pro His Asn Phe Pro
435 440 445
Met Ala Gln Met Pro Gln Gly Leu Thr Pro Thr Ala Pro Pro Ala Asp
450 455 460

Pro Ala Val Asp Met Leu Lys Asn Tyr Met Lys Met Gly Lys Arg Gln
465 470 475 480

Arg Glu Lys Gln Arg Glu Asn Arg Glu Arg Pro Tyr Lys Glu Val Ser
485 490 495
Glu Asp Leu Leu His Leu Ser Ser Leu Phe Gly Glu Asp Gln Pro Gly
500 505 510
Gly Ala Thr Ser Lys Arg Arg Ser Lys Pro Ser Gly Asp Leu Arg Gln
515 520 525
Lys Leu Leu Arg Ala Arg Gly Glu Asn Tyr Gly Arg Leu Trp Gly Glu
530 535 540

Leu Glu Asp Gly Ser Ser Gln Ser Leu Gly Gly Leu Gly Lys Gly Leu
545 550 555 560
Ser Ser Arg Ser Cys Glu Gly Gln Lys Tyr Ser Gln Gly Gln Phe Met
565 570 575
Asn Thr Pro Trp Lys Asn Pro Ala Glu Glu Lys Glu Lys Leu Pro Tyr
580 585 590
Arg Lys Gln Asn Ile Asp Asp Val Asp Glu Glu Asp Asn Asp Leu Val
595 600 605

Gly Val Ser Val Arg Pro Lys Val Pro Leu Arg Thr Met Ser Tyr Lys
610 615 620
Leu Ala Ile Asp Met Ser His Phe Ile Lys Glu Lys Gly Gly Leu Glu
625 630 635 640
Gly Ile Tyr Tyr Ser Ala Arg Arg His Arg Ile Leu Asp Ile Tyr Leu
645 650 655
Glu Lys Glu Glu Gly Ile Ile Pro Asp Trp Gln Asp Tyr Thr Ser Gly
660 665 670

Pro Gly Ile Arg Tyr Pro Lys Thr Phe Gly Trp Leu Trp Lys Leu Val
675 680 685
Pro Val Asp Met Ser Asn Glu Ala Gln Glu Asp Asp Thr His Tyr Leu
690 695 700
Val His Pro Ala Gln Thr His Gln Trp Ser Asp Pro Trp Gly Glu Val

705 710 715 720

Leu Val Trp Lys Phe Asp Pro Leu Leu Ala His Thr Tyr Glu Ala Phe

725 730 735

Val Arg His Pro Glu Glu Phe Gly Trp Lys Ser Gly Leu Pro Lys Glu

740 745 750

Glu Val Glu Arg Arg Leu Ala Ala Arg Gly Leu Leu Lys Met Ala Asp

755 760 765

Lys Lys Glu Thr Arg

770

<210> 714

<211> 312

<212> PRT

<213> Artificial Sequence

<220><223> SIV gag/nef conserved

<400> 714

Met Pro Val Gln Gln Ile Gly Gly Asn Tyr Val His Leu Pro Leu Ser

1 5 10 15

Pro Arg Thr Leu Asn Ala Trp Val Lys Leu Ile Glu Glu Lys Lys Phe

20 25 30

Gly Ala Glu Val Val Pro Gly Phe Gln Ala Leu Ser Glu Gly Cys Thr

35 40 45

Pro Tyr Asp Ile Asn Gln Met Leu Asn Cys Val Gly Asp His Gln Ala

50 55 60

Ala Met Gln Ile Ile Arg Asp Ile Ile Asn Glu Glu Ala Ala Asp Trp

65 70 75 80

Asp Leu Gln His Pro Gln Pro Ala Pro Gln Gln Gly Gln Leu Arg Glu

85 90 95

Pro Ser Gly Ser Asp Ile Ala Gly Thr Thr Ser Ser Val Asp Glu Gln

100 105 110

Ile Gln Trp Met Tyr Arg Gln Gln Asn Pro Ile Pro Val Gly Asn Ile

115 120 125

Tyr Arg Arg Trp Ile Gln Leu Gly Leu Gln Lys Cys Val Arg Met Tyr

130 135 140

Asn Pro Thr Asn Ile Leu Asp Val Lys Gln Gly Pro Lys Glu Pro Phe
145 150 155 160
Gln Ser Tyr Val Asp Arg Phe Tyr Lys Ser Leu Arg Ala Glu Gln Thr
165 170 175
Asp Ala Ala Val Lys Asn Trp Met Thr Gln Thr Leu Leu Ile Gln Asn
180 185 190
Ala Asn Pro Asp Cys Lys Leu Val Leu Lys Gly Leu Gly Val Asn Pro
195 200 205

Thr Leu Glu Glu Met Leu Thr Ala Cys Gln Gly Val Gly Gly Pro Gly
210 215 220
Gln Lys Ala Arg Leu Met Val Gly Val Ser Val Arg Pro Lys Val Pro
225 230 235 240
Leu Arg Thr Met Ser Tyr Lys Leu Ala Ile Asp Met Ser His Phe Ile
245 250 255
Lys Glu Lys Gly Gly Leu Glu Gly Ile Tyr Tyr Ser Ala Arg Arg His
260 265 270

Arg Ile Leu Asp Ile Tyr Leu Glu Lys Glu Glu Gly Ile Ile Pro Asp
275 280 285
Trp Gln Asp Tyr Thr Ser Gly Pro Gly Ile Arg Tyr Pro Lys Thr Phe
290 295 300
Gly Trp Leu Trp Lys Leu Val Pro
305 310

<210> 715
<211> 1009
<212> PRT
<213> Artificial Sequence
<220><223> SIV pol hybrid
<400> 715
Met Phe Phe Arg Ala Trp Pro Met Gly Lys Glu Ala Ser Gln Phe Pro
1 5 10 15

```
His Gly Pro Asp Ala Ser Gly Ala Asp Thr Asn Cys Ser Pro Arg Gly
            20                  25                  30
Ser Ser Cys Gly Ser Thr Glu Glu Leu His Glu Val Gly Gln Lys Ala
        35                  40                  45
Glu Arg Lys Ala Glu Gly Glu Gln Arg Glu Thr Leu Gln Gly Gly Asn
    50                  55                  60
Gly Gly Phe Ala Ala Pro Gln Phe Ser Leu Trp Arg Arg Pro Val Val
65                  70                  75                  80

Thr Ala His Ile Glu Gly Gln Pro Val Glu Val Leu Leu Ala Asp Asp
                85                  90                  95
Ser Ile Val Thr Gly Ile Glu Leu Gly Pro His Tyr Thr Pro Lys Ile
            100                 105                 110
Val Gly Gly Ile Gly Gly Phe Ile Asn Thr Lys Glu Tyr Lys Asn Val
        115                 120                 125
Glu Ile Glu Val Leu Gly Lys Arg Ile Lys Gly Thr Ile Met Thr Gly
    130                 135                 140

Asp Thr Pro Ile Asn Ile Phe Gly Arg Asn Leu Leu Thr Ala Leu Gly
145                 150                 155                 160
Met Ser Leu Asn Phe Pro Ile Ala Lys Val Glu Pro Val Lys Val Ala
                165                 170                 175
Leu Lys Pro Gly Lys Asp Gly Pro Lys Leu Lys Gln Trp Pro Leu Ser
            180                 185                 190
Lys Glu Lys Ile Val Ala Leu Arg Glu Ile Cys Glu Lys Met Glu Lys
        195                 200                 205

Asp Gly Gln Leu Glu Glu Ala Pro Pro Thr Asn Pro Tyr Asn Thr Pro
    210                 215                 220
Thr Phe Ala Ile Lys Lys Lys Asp Lys Asn Lys Trp Arg Met Leu Ile
225                 230                 235                 240
Asp Phe Arg Glu Leu Asn Arg Val Thr Gln Asp Phe Thr Glu Val Gln
                245                 250                 255
Leu Gly Ile Pro His Pro Ala Gly Leu Ala Lys Arg Lys Arg Ile Thr
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260 265 270

Val Leu Asp Ile Gly Asp Ala Tyr Phe Ser Ile Pro Leu Asp Glu Glu
275 280 285
Phe Arg Gln Tyr Thr Ala Phe Thr Leu Pro Ser Val Asn Asn Ala Glu
290 295 300
Pro Gly Lys Arg Tyr Ile Tyr Lys Val Leu Pro Gln Gly Trp Lys Gly
305 310 315 320
Ser Pro Ala Ile Phe Gln Tyr Thr Met Arg His Val Leu Glu Pro Phe
325 330 335

Arg Lys Ala Asn Pro Asp Val Thr Leu Val Gln Ile Leu Ile Ala Ser
340 345 350
Asp Arg Thr Asp Leu Glu His Asp Arg Val Val Leu Gln Ser Lys Glu
355 360 365
Leu Leu Asn Ser Ile Gly Phe Ser Thr Pro Glu Glu Lys Phe Gln Lys
370 375 380
Asp Pro Pro Phe Gln Trp Met Gly Tyr Glu Leu Trp Pro Thr Lys Trp
385 390 395 400

Lys Leu Gln Lys Ile Glu Leu Pro Gln Arg Glu Thr Trp Thr Val Asn
405 410 415
Asp Ile Gln Lys Leu Val Gly Val Leu Asn Trp Ala Ala Gln Ile Tyr
420 425 430
Pro Gly Ile Lys Thr Lys Asn Leu Cys Lys Met Ile Arg Gly Lys Met
435 440 445
Ala Leu Thr Glu Gly Val Gln Trp Thr Glu Leu Ala Glu Ala Glu Leu
450 455 460

Glu Glu Asn Arg Ile Ile Leu Asn Gln Glu Gln Glu Gly Arg Tyr Tyr
465 470 475 480
Arg Glu Asp Lys Pro Leu Glu Ala Thr Val Leu Lys Asn Gln Asp Asn
485 490 495
Gln Trp Thr Tyr Lys Ile His Gln Gly Asp Arg Ile Leu Lys Val Gly
500 505 510

Lys Tyr Ala Lys Val Lys Asn Thr His Thr Asn Gly Ile Arg Leu Leu
515 520 525

Ala Asn Val Val Gln Lys Ile Gly Lys Glu Ser Ile Val Ile Trp Gly
530 535 540
Gln Thr Pro Phe Phe His Leu Pro Val Glu Arg Glu Val Trp Asp Gln
545 550 555 560
Trp Trp Thr Asp Tyr Trp Gln Ala Thr Trp Ile Pro Asp Trp Asp Phe
565 570 575
Val Ser Thr Pro Pro Leu Ile Arg Leu Val Phe Asn Leu Val Lys Glu
580 585 590

Pro Ile Glu Lys Glu Glu Val Tyr Tyr Ile Asp Gly Ser Cys Asn Arg
595 600 605
Asn Ser Lys Glu Gly Lys Ala Gly Tyr Val Thr Asp Arg Gly Lys Glu
610 615 620
Lys Val Leu Val Leu Glu Gln Ala Thr Asn Gln Gln Ala Leu Gln Ala
625 630 635 640
Phe Leu Leu Ala Leu Lys Asp Ser Gly Pro Lys Ala Asn Ile Val Thr
645 650 655

Asp Ser Gln Tyr Val Leu Gly Ile Ile Thr Gly Gln Pro Thr Glu Ser
660 665 670
Asp Ser Arg Ile Val Ala Gln Ile Ile Glu Gln Met Ile Lys Lys Ser
675 680 685
Glu Val Tyr Ile Gly Trp Val Pro Ala His Lys Gly Leu Gly Gly Asn
690 695 700
Gln Glu Val Asp Arg Leu Val Ser Gln Glu Ile Arg Gln Val Leu Phe
705 710 715 720

Leu Glu Ser Ile Glu Pro Ala Gln Glu Asp His Asp Lys Tyr His Ser
725 730 735
Asn Ile Lys Glu Leu Ala Phe Lys Phe Gly Leu Pro Arg Leu Val Ala
740 745 750
Lys Gln Ile Val Asp Thr Cys Asn Lys Cys Gln Gln Lys Gly Glu Ala

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        755                 760                 765
Ile His Gly Gln Ala Asn Ser Asp Leu Gly Thr Trp Gln Met Cys Thr
    770                 775                 780

His Leu Glu Gly Lys Ile Ile Ile Val Ala Val His Val Ala Ser Gly
785                 790                 795                 800
Phe Ile Glu Ala Glu Val Ile Pro Gln Glu Thr Gly Arg Gln Thr Ala
                805                 810                 815
Leu Phe Leu Leu Lys Leu Ala Gly Arg Trp Pro Ile Thr His Leu His
            820                 825                 830
Thr Asn Gly Ala Asn Phe Ala Ser Gln Glu Val Lys Met Val Ala Trp
        835                 840                 845

Trp Ala Gly Ile Glu His Thr Phe Gly Val Pro Tyr Asn Pro Gln Ser
    850                 855                 860
Gln Gly Val Val Ala Met Asn His His Leu Lys Asn Gln Ile Asp Arg
865                 870                 875                 880
Ile Arg Glu Gln Ala Asn Ser Val Glu Thr Ile Val Leu Met Ala Val
                885                 890                 895
His Cys Met Asn Phe Lys Arg Arg Gly Gly Ile Gly Asp Met Thr Pro
            900                 905                 910

Ala Glu Arg Leu Ile Asn Met Ile Thr Thr Glu Gln Glu Ile Gln Phe
        915                 920                 925
Gln Gln Ser Lys Asn Ser Lys Phe Lys Asn Phe Arg Val Tyr Tyr Arg
    930                 935                 940
Glu Gly Arg Asp Gln Leu Trp Lys Gly Pro Gly Glu Leu Leu Trp Lys
945                 950                 955                 960
Gly Glu Gly Ala Val Ile Leu Lys Val Gly Thr Asp Ile Lys Val Val
                965                 970                 975

Pro Arg Arg Lys Ala Lys Ile Ile Lys Asp Tyr Gly Gly Gly Lys Glu
            980                 985                 990
Val Asp Ser Ser Ser His Met Glu  Asp Thr Gly Glu Ala  Arg Glu Val
        995                 1000                1005
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Ala

<210> 716

<211> 604

<212> PRT

<213> Artificial Sequence

<220><223> SIV pol conserved

<400> 716

Met Pro Gln Phe Ser Leu Trp Arg Arg Pro Val Val Thr Ala His Ile
1 5 10 15

Glu Gly Gln Pro Val Glu Val Leu Leu Ala Asp Asp Ser Ile Val Thr
20 25 30

Gly Ile Glu Leu Gly Pro His Tyr Thr Pro Lys Ile Val Gly Gly Ile
35 40 45

Gly Gly Phe Ile Asn Thr Lys Glu Tyr Lys Asn Val Glu Ile Glu Val
50 55 60

Leu Gly Lys Arg Ile Lys Gly Thr Ile Met Thr Gly Asp Thr Pro Ile
65 70 75 80

Asn Ile Phe Gly Arg Asn Leu Leu Thr Ala Leu Gly Met Ser Leu Asn
85 90 95

Phe Pro Ile Ala Lys Val Glu Pro Val Lys Val Ala Leu Lys Pro Gly
100 105 110

Lys Asp Gly Pro Lys Leu Lys Gln Trp Pro Leu Ser Lys Glu Lys Ile
115 120 125

Val Ala Leu Arg Glu Ile Cys Glu Lys Met Glu Lys Asp Gly Gln Leu
130 135 140

Glu Glu Ala Pro Pro Thr Asn Pro Tyr Asn Thr Pro Thr Phe Ala Ile
145 150 155 160

Lys Lys Lys Asp Lys Asn Lys Trp Arg Met Leu Ile Asp Phe Arg Glu
165 170 175

Leu Asn Arg Val Thr Gln Asp Phe Thr Glu Val Gln Leu Gly Ile Pro
180 185 190

His Pro Ala Gly Leu Ala Lys Arg Lys Arg Ile Thr Val Leu Asp Ile
195 200 205

Gly Asp Ala Tyr Phe Ser Ile Pro Leu Asp Glu Glu Phe Arg Gln Tyr
210 215 220
Thr Ala Phe Thr Leu Pro Ser Val Asn Asn Ala Glu Pro Gly Lys Arg
225 230 235 240
Tyr Ile Tyr Lys Val Leu Pro Gln Gly Trp Lys Gly Ser Pro Ala Ile
245 250 255
Phe Gln Tyr Thr Met Arg His Val Leu Glu Pro Phe Arg Lys Ala Asn
260 265 270

Pro Asp Val Thr Leu Val Gln Ile Leu Ile Ala Ser Asp Arg Thr Asp
275 280 285
Leu Glu His Asp Arg Val Val Leu Gln Ser Lys Glu Leu Leu Asn Ser
290 295 300
Ile Gly Phe Ser Thr Pro Glu Glu Lys Phe Gln Lys Asp Pro Pro Phe
305 310 315 320
Gln Trp Met Gly Tyr Glu Leu Trp Pro Thr Lys Trp Lys Leu Gln Lys
325 330 335

Ile Glu Leu Pro Gln Arg Glu Thr Trp Thr Val Asn Asp Ile Gln Lys
340 345 350
Leu Val Gly Val Leu Asn Trp Ala Ala Gln Ile Tyr His Gly Gln Ala
355 360 365
Asn Ser Asp Leu Gly Thr Trp Gln Met Cys Thr His Leu Glu Gly Lys
370 375 380
Ile Ile Ile Val Ala Val His Val Ala Ser Gly Phe Ile Glu Ala Glu
385 390 395 400

Val Ile Pro Gln Glu Thr Gly Arg Gln Thr Ala Leu Phe Leu Leu Lys
405 410 415
Leu Ala Gly Arg Trp Pro Ile Thr His Leu His Thr Asn Gly Ala Asn
420 425 430
Phe Ala Ser Gln Glu Val Lys Met Val Ala Trp Trp Ala Gly Ile Glu

435 440 445

His Thr Phe Gly Val Pro Tyr Asn Pro Gln Ser Gln Gly Val Val Ala

450 455 460

Met Asn His His Leu Lys Asn Gln Ile Asp Arg Ile Arg Glu Gln Ala

465 470 475 480

Asn Ser Val Glu Thr Ile Val Leu Met Ala Val His Cys Met Asn Phe

485 490 495

Lys Arg Arg Gly Gly Ile Gly Asp Met Thr Pro Ala Glu Arg Leu Ile

500 505 510

Asn Met Ile Thr Thr Glu Gln Glu Ile Gln Phe Gln Gln Ser Lys Asn

515 520 525

Ser Lys Phe Lys Asn Phe Arg Val Tyr Tyr Arg Glu Gly Arg Asp Gln

530 535 540

Leu Trp Lys Gly Pro Gly Glu Leu Leu Trp Lys Gly Glu Gly Ala Val

545 550 555 560

Ile Leu Lys Val Gly Thr Asp Ile Lys Val Val Pro Arg Arg Lys Ala

565 570 575

Lys Ile Ile Lys Asp Tyr Gly Gly Gly Lys Glu Val Asp Ser Ser Ser

580 585 590

His Met Glu Asp Thr Gly Glu Ala Arg Glu Val Ala

595 600

<210> 717

<211> 1003

<212> PRT

<213> Artificial Sequence

<220><223> HIV B pol epigraph1

<400> 717

Phe Phe Arg Glu Asn Leu Ala Phe Pro Gln Gly Lys Ala Arg Glu Phe

1 5 10 15

Ser Ser Glu Gln Thr Arg Ala Asn Ser Pro Thr Arg Arg Glu Leu Gln

20 25 30

Val Trp Gly Arg Asp Asn Asn Ser Leu Ser Glu Ala Gly Ala Asp Arg

35 40 45

Gln Gly Thr Val Ser Phe Ser Phe Pro Gln Ile Thr Leu Trp Gln Arg

50 55 60

Pro Leu Val Thr Ile Lys Ile Gly Gly Gln Leu Lys Glu Ala Leu Leu

65 70 75 80

Asp Thr Gly Ala Asp Asp Thr Val Leu Glu Glu Met Asn Leu Pro Gly

85 90 95

Arg Trp Lys Pro Lys Met Ile Gly Gly Ile Gly Gly Phe Ile Lys Val

100 105 110

Arg Gln Tyr Asp Gln Ile Pro Ile Glu Ile Cys Gly His Lys Ala Ile

115 120 125

Gly Thr Val Leu Val Gly Pro Thr Pro Val Asn Ile Ile Gly Arg Asn

130 135 140

Leu Leu Thr Gln Ile Gly Cys Thr Leu Asn Phe Pro Ile Ser Pro Ile

145 150 155 160

Glu Thr Val Pro Val Lys Leu Lys Pro Gly Met Asp Gly Pro Lys Val

165 170 175

Lys Gln Trp Pro Leu Thr Glu Glu Lys Ile Lys Ala Leu Val Glu Ile

180 185 190

Cys Thr Glu Met Glu Lys Glu Gly Lys Ile Ser Lys Ile Gly Pro Glu

195 200 205

Asn Pro Tyr Asn Thr Pro Val Phe Ala Ile Lys Lys Lys Asp Ser Thr

210 215 220

Lys Trp Arg Lys Leu Val Asp Phe Arg Glu Leu Asn Lys Arg Thr Gln

225 230 235 240

Asp Phe Trp Glu Val Gln Leu Gly Ile Pro His Pro Ala Gly Leu Lys

245 250 255

Lys Lys Lys Ser Val Thr Val Leu Asp Val Gly Asp Ala Tyr Phe Ser

260 265 270

Val Pro Leu Asp Lys Asp Phe Arg Lys Tyr Thr Ala Phe Thr Ile Pro

275 280 285

Ser Ile Asn Asn Glu Thr Pro Gly Ile Arg Tyr Gln Tyr Asn Val Leu

290 295 300

Pro Gln Gly Trp Lys Gly Ser Pro Ala Ile Phe Gln Ser Ser Met Thr

305 310 315 320

Lys Ile Leu Glu Pro Phe Arg Lys Gln Asn Pro Asp Ile Val Ile Tyr

325 330 335

Gln Tyr Met Asp Asp Leu Tyr Val Gly Ser Asp Leu Glu Ile Gly Gln

340 345 350

His Arg Thr Lys Ile Glu Glu Leu Arg Gln His Leu Leu Arg Trp Gly

355 360 365

Phe Thr Thr Pro Asp Lys Lys His Gln Lys Glu Pro Pro Phe Leu Trp

370 375 380

Met Gly Tyr Glu Leu His Pro Asp Lys Trp Thr Val Gln Pro Ile Val

385 390 395 400

Leu Pro Glu Lys Asp Ser Trp Thr Val Asn Asp Ile Gln Lys Leu Val

405 410 415

Gly Lys Leu Asn Trp Ala Ser Gln Ile Tyr Ala Gly Ile Lys Val Lys

420 425 430

Gln Leu Cys Lys Leu Leu Arg Gly Thr Lys Ala Leu Thr Glu Val Val

435 440 445

Pro Leu Thr Glu Glu Ala Glu Leu Glu Leu Ala Glu Asn Arg Glu Ile

450 455 460

Leu Lys Glu Pro Val His Gly Val Tyr Tyr Asp Pro Ser Lys Asp Leu

465 470 475 480

Ile Ala Glu Ile Gln Lys Gln Gly Gln Gly Gln Trp Thr Tyr Gln Ile

485 490 495

Tyr Gln Glu Pro Phe Lys Asn Leu Lys Thr Gly Lys Tyr Ala Arg Met

500 505 510

Arg Gly Ala His Thr Asn Asp Val Lys Gln Leu Thr Glu Ala Val Gln

515 520 525

Lys Ile Ala Thr Glu Ser Ile Val Ile Trp Gly Lys Thr Pro Lys Phe
530 535 540
Lys Leu Pro Ile Gln Lys Glu Thr Trp Glu Ala Trp Trp Thr Glu Tyr

545 550 555 560
Trp Gln Ala Thr Trp Ile Pro Glu Trp Glu Phe Val Asn Thr Pro Pro
565 570 575
Leu Val Lys Leu Trp Tyr Gln Leu Glu Lys Glu Pro Ile Val Gly Ala
580 585 590
Glu Thr Phe Tyr Val Asp Gly Ala Ala Asn Arg Glu Thr Lys Leu Gly
595 600 605
Lys Ala Gly Tyr Val Thr Asp Arg Gly Arg Gln Lys Val Val Ser Leu

610 615 620
Thr Asp Thr Thr Asn Gln Lys Thr Glu Leu Gln Ala Ile His Leu Ala
625 630 635 640
Leu Gln Asp Ser Gly Leu Glu Val Asn Ile Val Thr Asp Ser Gln Tyr
645 650 655
Ala Leu Gly Ile Ile Gln Ala Gln Pro Asp Lys Ser Glu Ser Glu Leu
660 665 670
Val Ser Gln Ile Ile Glu Gln Leu Ile Lys Lys Glu Lys Val Tyr Leu

675 680 685
Ala Trp Val Pro Ala His Lys Gly Ile Gly Gly Asn Glu Gln Val Asp
690 695 700
Lys Leu Val Ser Ala Gly Ile Arg Lys Val Leu Phe Leu Asp Gly Ile
705 710 715 720
Asp Lys Ala Gln Glu Glu His Glu Lys Tyr His Ser Asn Trp Arg Ala
725 730 735
Met Ala Ser Asp Phe Asn Leu Pro Pro Val Val Ala Lys Glu Ile Val

740 745 750
Ala Ser Cys Asp Lys Cys Gln Leu Lys Gly Glu Ala Met His Gly Gln
755 760 765
Val Asp Cys Ser Pro Gly Ile Trp Gln Leu Asp Cys Thr His Leu Glu

770 775 780

Gly Lys Ile Ile Leu Val Ala Val His Val Ala Ser Gly Tyr Ile Glu

785 790 795 800

Ala Glu Val Ile Pro Ala Glu Thr Gly Gln Glu Thr Ala Tyr Phe Leu

805 810 815

Leu Lys Leu Ala Gly Arg Trp Pro Val Lys Thr Ile His Thr Asp Asn

820 825 830

Gly Ser Asn Phe Thr Ser Thr Thr Val Lys Ala Ala Cys Trp Trp Ala

835 840 845

Gly Ile Lys Gln Glu Phe Gly Ile Pro Tyr Asn Pro Gln Ser Gln Gly

850 855 860

Val Val Glu Ser Met Asn Lys Glu Leu Lys Lys Ile Ile Gly Gln Val

865 870 875 880

Arg Asp Gln Ala Glu His Leu Lys Thr Ala Val Gln Met Ala Val Phe

885 890 895

Ile His Asn Phe Lys Arg Lys Gly Gly Ile Gly Gly Tyr Ser Ala Gly

900 905 910

Glu Arg Ile Val Asp Ile Ile Ala Thr Asp Ile Gln Thr Lys Glu Leu

915 920 925

Gln Lys Gln Ile Thr Lys Ile Gln Asn Phe Arg Val Tyr Tyr Arg Asp

930 935 940

Ser Arg Asp Pro Leu Trp Lys Gly Pro Ala Lys Leu Leu Trp Lys Gly

945 950 955 960

Glu Gly Ala Val Val Ile Gln Asp Asn Ser Asp Ile Lys Val Val Pro

965 970 975

Arg Arg Lys Ala Lys Ile Ile Arg Asp Tyr Gly Lys Gln Met Ala Gly

980 985 990

Asp Asp Cys Val Ala Ser Arg Gln Asp Glu Asp

995 1000

<210> 718

<211> 499

<212> PRT

<213> Artificial Sequence

<220><223> HIV M gag Epigraph1

<400> 718

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Ala Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Lys
370 375 380

Gly Gln Lys Arg Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile
385 390 395 400

Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly
405 410 415

Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe
420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu
435 440 445

Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg Phe
450 455 460

Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp Lys

465 470 475 480

Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro

485 490 495

Leu Ser Gln

<210> 719

<211> 231

<212> PRT

<213> Artificial Sequence

<220><223> HIV M gag Epigraph1 Conserved

<400> 719

Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln Ala Ile Ser

1 5 10 15

Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys Ala Phe

20 25 30

Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu Gly Ala Thr

35 40 45

Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His Gln Ala

50 55 60

Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp

65 70 75 80

Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala Pro Gly Gln Met

85 90 95

Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln

100 105 110

Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro Val Gly Glu

115 120 125

Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg Met

130 135 140

Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro

145 150 155 160

Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln

165 170 175

Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln
180 185 190
Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro Ala
195 200 205
Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro
210 215 220
Gly His Lys Ala Arg Val Leu
225 230

<210> 720

<211> 496

<212> PRT

<213> Artificial Sequence

<220><223> HIV M gag Epigraph2

<400> 720

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ala Glu Gly Cys Gln Gln Ile Ile Glu Gln Leu
50 55 60

Gln Ser Thr Leu Lys Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Gln
100 105 110
Gln Lys Thr Gln Gln Ala Ala Ala Gly Thr Gly Ser Ser Ser Lys Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ala Gln Gly Gln Met Val His
130 135 140
Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Met Met Leu Asn Ile Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Pro
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile
245 250 255

Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Asp Thr
305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Arg Ala
325 330 335
Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Arg Glu Gly His Gln Met Lys Asp Cys Asn Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser Asn Lys Gly Arg Pro Gly Asn Phe
435 440 445

Pro Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg
450 455 460
Phe Glu Glu Thr Thr Pro Ala Pro Lys Gln Glu Pro Lys Asp Arg Glu
465 470 475 480
Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Ser Asp Pro Leu Ser Gln
485 490 495

<210> 721
<211> 231
<212> PRT
<213> Artificial Sequence
<220><223> HIV M gag Epigraph2 Conserved
<400
> 721

Pro Ile Val Gln Asn Ala Gln Gly Gln Met Val His Gln Pro Leu Ser
1 5 10 15
Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys Ala Phe
20 25 30
Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser Glu Gly Ala Thr
35 40 45
Pro Gln Asp Leu Asn Met Met Leu Asn Ile Val Gly Gly His Gln Ala
50 55 60

Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu Ala Ala Glu Trp
65 70 75 80

Asp Arg Val His Pro Val His Ala Gly Pro Ile Pro Pro Gly Gln Met
85 90 95
Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Asn Leu Gln
100 105 110
Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile Pro Val Gly Asp
115 120 125

Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg Met
130 135 140
Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly Pro Lys Glu Pro
145 150 155 160
Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys Thr Leu Arg Ala Glu Gln
165 170 175
Ala Ser Gln Glu Val Lys Asn Trp Met Thr Asp Thr Leu Leu Val Gln
180 185 190

Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Arg Ala Leu Gly Pro Gly
195 200 205
Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro
210 215 220
Ser His Lys Ala Arg Val Leu
225 230

<210> 722
<211> 206
<212> PRT
<213> Artificial Sequence
<220><223> HIV M nef Epigraph1
<400> 722
Met Gly Gly Lys Trp Ser Lys Ser Ser Ile Val Gly Trp Pro Ala Val
1 5 10 15

Arg Glu Arg Met Arg Arg Ala Glu Pro Ala Ala Glu Gly Val Gly Ala
20 25 30
Val Ser Arg Asp Leu Glu Lys His Gly Ala Ile Thr Ser Ser Asn Thr
35 40 45

Ala Ala Thr Asn Ala Asp Cys Ala Trp Leu Glu Ala Gln Glu Glu Glu
50 55 60
Glu Val Gly Phe Pro Val Arg Pro Gln Val Pro Leu Arg Pro Met Thr
65 70 75 80

Tyr Lys Gly Ala Leu Asp Leu Ser His Phe Leu Lys Glu Lys Gly Gly
85 90 95
Leu Glu Gly Leu Ile Tyr Ser Lys Lys Arg Gln Glu Ile Leu Asp Leu
100 105 110
Trp Val Tyr His Thr Gln Gly Tyr Phe Pro Asp Trp Gln Asn Tyr Thr
115 120 125
Pro Gly Pro Gly Ile Arg Tyr Pro Leu Thr Phe Gly Trp Cys Phe Lys
130 135 140

Leu Val Pro Val Asp Pro Arg Glu Val Glu Glu Ala Asn Glu Gly Glu
145 150 155 160
Asn Asn Cys Leu Leu His Pro Met Ser Gln His Gly Met Asp Asp Pro
165 170 175
Glu Lys Glu Val Leu Met Trp Lys Phe Asp Ser Arg Leu Ala Phe His
180 185 190
His Met Ala Arg Glu Leu His Pro Glu Tyr Tyr Lys Asp Cys
195 200 205

<210> 723
<211> 82
<212> PRT
<213> Artificial Sequence
<220><223> HIV M nef Epigraph1 Conserved
<400> 723
Val Gly Phe Pro Val Arg Pro Gln Val Pro Leu Arg Pro Met Thr Tyr
1 5 10 15
Lys Gly Ala Leu Asp Leu Ser His Phe Leu Lys Glu Lys Gly Gly Leu
20 25 30
Glu Gly Leu Ile Tyr Ser Lys Lys Arg Gln Glu Ile Leu Asp Leu Trp

35 40 45

Val Tyr His Thr Gln Gly Tyr Phe Pro Asp Trp Gln Asn Tyr Thr Pro
50 55 60
Gly Pro Gly Ile Arg Tyr Pro Leu Thr Phe Gly Trp Cys Phe Lys Leu
65 70 75 80
Val Pro

<210> 724
<211> 206
<212> PRT
<213> Artificial Sequence
<220><223> HIV M nef Epigraph2
<400> 724
Met Gly Ser Lys Trp Ser Lys Ser Ser Ile Val Gly Trp Pro Ala Ile
1 5 10 15

Arg Glu Arg Met Arg Arg Thr Glu Pro Ala Ala Glu Gly Val Gly Ala
20 25 30
Ala Ser Arg Asp Leu Glu Arg His Gly Ala Ile Thr Ser Ser Asn Thr
35 40 45
Ala Ala Asn Asn Ala Asp Cys Ala Trp Leu Glu Ala Gln Glu Asp Glu
50 55 60
Glu Val Gly Phe Pro Val Lys Pro Gln Val Pro Leu Arg Pro Met Thr
65 70 75 80

Tyr Lys Ala Ala Phe Asp Leu Ser Phe Phe Leu Lys Glu Lys Gly Gly
85 90 95
Leu Asp Gly Leu Ile Tyr Ser Gln Lys Arg Gln Asp Ile Leu Asp Leu
100 105 110
Trp Val Tyr Asn Thr Gln Gly Phe Phe Pro Asp Trp Gln Asn Tyr Thr
115 120 125
Pro Gly Pro Gly Val Arg Tyr Pro Leu Thr Phe Gly Trp Cys Phe Lys
130 135 140

Leu Val Pro Val Glu Pro Glu Lys Val Glu Glu Ala Asn Glu Gly Glu
145 150 155 160
Asn Asn Ser Leu Leu His Pro Met Ser Leu His Gly Met Asp Asp Pro
165 170 175
Glu Arg Glu Val Leu Met Trp Lys Phe Asp Ser Ser Leu Ala Arg Arg
180 185 190
His Met Ala Arg Glu Leu His Pro Glu Phe Tyr Lys Asp Cys
195 200 205

<210> 725
<211> 82
<212> PRT
<213> Artificial Sequence
<220><223> HIV M nef Epigraph2 Conserved
<400> 725
Val Gly Phe Pro Val Lys Pro Gln Val Pro Leu Arg Pro Met Thr Tyr
1 5 10 15
Lys Ala Ala Phe Asp Leu Ser Phe Phe Leu Lys Glu Lys Gly Gly Leu
20 25 30
Asp Gly Leu Ile Tyr Ser Gln Lys Arg Gln Asp Ile Leu Asp Leu Trp
35 40 45

Val Tyr Asn Thr Gln Gly Phe Phe Pro Asp Trp Gln Asn Tyr Thr Pro
50 55 60
Gly Pro Gly Val Arg Tyr Pro Leu Thr Phe Gly Trp Cys Phe Lys Leu
65 70 75 80
Val Pro

<210> 726
<211> 1004
<212> PRT
<213> Artificial Sequence
<220><223> HIV M pol Epigraph1
<400> 726
Phe Phe Arg Glu Asn Leu Ala Phe Pro Gln Gly Glu Ala Arg Glu Phe

1 5 10 15

Ser Ser Glu Gln Thr Arg Ala Asn Ser Pro Thr Arg Arg Glu Leu Gln
20 25 30
Val Trp Gly Arg Asp Asn Asn Ser Leu Ser Glu Ala Gly Ala Asp Arg
35 40 45
Gln Gly Thr Val Ser Phe Ser Phe Pro Gln Ile Thr Leu Trp Gln Arg
50 55 60
Pro Leu Val Thr Ile Lys Ile Gly Gly Gln Leu Lys Glu Ala Leu Leu
65 70 75 80

Asp Thr Gly Ala Asp Asp Thr Val Leu Glu Asp Ile Asn Leu Pro Gly
85 90 95
Lys Trp Lys Pro Lys Met Ile Gly Gly Ile Gly Gly Phe Ile Lys Val
100 105 110
Arg Gln Tyr Asp Gln Ile Leu Ile Glu Ile Cys Gly Lys Lys Ala Ile
115 120 125
Gly Thr Val Leu Val Gly Pro Thr Pro Val Asn Ile Ile Gly Arg Asn
130 135 140

Leu Leu Thr Gln Ile Gly Cys Thr Leu Asn Phe Pro Ile Ser Pro Ile
145 150 155 160
Glu Thr Val Pro Val Lys Leu Lys Pro Gly Met Asp Gly Pro Lys Val
165 170 175
Lys Gln Trp Pro Leu Thr Glu Glu Lys Ile Lys Ala Leu Val Glu Ile
180 185 190
Cys Thr Glu Met Glu Lys Glu Gly Lys Ile Ser Lys Ile Gly Pro Glu
195 200 205

Asn Pro Tyr Asn Thr Pro Val Phe Ala Ile Lys Lys Lys Asp Ser Thr
210 215 220
Lys Trp Arg Lys Leu Val Asp Phe Arg Glu Leu Asn Lys Arg Thr Gln
225 230 235 240
Asp Phe Trp Glu Val Gln Leu Gly Ile Pro His Pro Ala Gly Leu Lys
245 250 255

Lys Lys Lys Ser Val Thr Val Leu Asp Val Gly Asp Ala Tyr Phe Ser
260 265 270

Val Pro Leu Asp Lys Asp Phe Arg Lys Tyr Thr Ala Phe Thr Ile Pro
275 280 285

Ser Ile Asn Asn Glu Thr Pro Gly Ile Arg Tyr Gln Tyr Asn Val Leu
290 295 300

Pro Gln Gly Trp Lys Gly Ser Pro Ala Ile Phe Gln Ser Ser Met Thr
305 310 315 320

Lys Ile Leu Glu Pro Phe Arg Lys Gln Asn Pro Asp Ile Val Ile Tyr
325 330 335

Gln Tyr Met Asp Asp Leu Tyr Val Gly Ser Asp Leu Glu Ile Gly Gln
340 345 350

His Arg Thr Lys Ile Glu Glu Leu Arg Gln His Leu Leu Lys Trp Gly
355 360 365

Phe Thr Thr Pro Asp Lys Lys His Gln Lys Glu Pro Pro Phe Leu Trp
370 375 380

Met Gly Tyr Glu Leu His Pro Asp Lys Trp Thr Val Gln Pro Ile Val
385 390 395 400

Leu Pro Glu Lys Asp Ser Trp Thr Val Asn Asp Ile Gln Lys Leu Val
405 410 415

Gly Lys Leu Asn Trp Ala Ser Gln Ile Tyr Pro Gly Ile Lys Val Lys
420 425 430

Gln Leu Cys Lys Leu Leu Arg Gly Ala Lys Ala Leu Thr Asp Ile Val
435 440 445

Pro Leu Thr Glu Glu Ala Glu Leu Glu Leu Ala Glu Asn Arg Glu Ile
450 455 460

Leu Lys Glu Pro Val His Gly Val Tyr Tyr Asp Pro Ser Lys Asp Leu
465 470 475 480

Ile Ala Glu Ile Gln Lys Gln Gly Gln Asp Gln Trp Thr Tyr Gln Ile
485 490 495

Tyr Gln Glu Pro Phe Lys Asn Leu Lys Thr Gly Lys Tyr Ala Arg Met

500 505 510

Arg Gly Ala His Thr Asn Asp Val Lys Gln Leu Thr Glu Ala Val Gln

515 520 525

Lys Ile Ala Thr Glu Ser Ile Val Ile Trp Gly Lys Thr Pro Lys Phe

530 535 540

Arg Leu Pro Ile Gln Lys Glu Thr Trp Glu Thr Trp Trp Thr Glu Tyr

545 550 555 560

Trp Gln Ala Thr Trp Ile Pro Glu Trp Glu Phe Val Asn Thr Pro Pro

565 570 575

Leu Val Lys Leu Trp Tyr Gln Leu Glu Lys Glu Pro Ile Val Gly Ala

580 585 590

Glu Thr Phe Tyr Val Asp Gly Ala Ala Asn Arg Glu Thr Lys Leu Gly

595 600 605

Lys Ala Gly Tyr Val Thr Asp Arg Gly Arg Gln Lys Val Val Ser Leu

610 615 620

Thr Glu Thr Thr Asn Gln Lys Thr Glu Leu Gln Ala Ile His Leu Ala

625 630 635 640

Leu Gln Asp Ser Gly Ser Glu Val Asn Ile Val Thr Asp Ser Gln Tyr

645 650 655

Ala Leu Gly Ile Ile Gln Ala Gln Pro Asp Lys Ser Glu Ser Glu Leu

660 665 670

Val Asn Gln Ile Ile Glu Gln Leu Ile Lys Lys Glu Lys Val Tyr Leu

675 680 685

Ser Trp Val Pro Ala His Lys Gly Ile Gly Gly Asn Glu Gln Val Asp

690 695 700

Lys Leu Val Ser Ser Gly Ile Arg Lys Val Leu Phe Leu Asp Gly Ile

705 710 715 720

Asp Lys Ala Gln Glu Glu His Glu Lys Tyr His Ser Asn Trp Arg Ala

725 730 735

Met Ala Ser Asp Phe Asn Leu Pro Pro Ile Val Ala Lys Glu Ile Val

740 745 750

Ala Ser Cys Asp Lys Cys Gln Leu Lys Gly Glu Ala Met His Gly Gln
755 760 765

Val Asp Cys Ser Pro Gly Ile Trp Gln Leu Asp Cys Thr His Leu Glu
770 775 780

Gly Lys Val Ile Leu Val Ala Val His Val Ala Ser Gly Tyr Ile Glu
785 790 795 800

Ala Glu Val Ile Pro Ala Glu Thr Gly Gln Glu Thr Ala Tyr Phe Leu
805 810 815

Leu Lys Leu Ala Gly Arg Trp Pro Val Lys Val Ile His Thr Asp Asn
820 825 830

Gly Ser Asn Phe Thr Ser Ala Ala Val Lys Ala Ala Cys Trp Trp Ala
835 840 845

Gly Ile Lys Gln Glu Phe Gly Ile Pro Tyr Asn Pro Gln Ser Gln Gly
850 855 860

Val Val Glu Ser Met Asn Lys Glu Leu Lys Lys Ile Ile Gly Gln Val
865 870 875 880

Arg Asp Gln Ala Glu His Leu Lys Thr Ala Val Gln Met Ala Val Phe
885 890 895

Ile His Asn Phe Lys Arg Lys Gly Gly Ile Gly Gly Tyr Ser Ala Gly
900 905 910

Glu Arg Ile Ile Asp Ile Ile Ala Thr Asp Ile Gln Thr Lys Glu Leu
915 920 925

Gln Lys Gln Ile Thr Lys Ile Gln Asn Phe Arg Val Tyr Tyr Arg Asp
930 935 940

Ser Arg Asp Pro Ile Trp Lys Gly Pro Ala Lys Leu Leu Trp Lys Gly
945 950 955 960

Glu Gly Ala Val Val Ile Gln Asp Asn Ser Asp Ile Lys Val Val Pro
965 970 975

Arg Arg Lys Ala Lys Ile Ile Arg Asp Tyr Gly Lys Gln Met Ala Gly
980 985 990

Asp Asp Cys Val Ala Gly Arg Gln Asp Glu Asp Gln

995 1000

<210> 727

<211> 609

<212> PRT

<213> Artificial Sequence

<220><223> HIV M pol Epigraph1 Conserved

<400> 727

Pro Gln Ile Thr Leu Trp Gln Arg Pro Leu Val Thr Ile Lys Ile Gly
1 5 10 15
Gly Gln Leu Lys Glu Ala Leu Leu Asp Thr Gly Ala Asp Asp Thr Val

20 25 30
Leu Glu Asp Ile Asn Leu Pro Gly Lys Trp Lys Pro Lys Met Ile Gly
35 40 45
Gly Ile Gly Gly Phe Ile Lys Val Arg Gln Tyr Asp Gln Ile Leu Ile
50 55 60
Glu Ile Cys Gly Lys Lys Ala Ile Gly Thr Val Leu Val Gly Pro Thr
65 70 75 80
Pro Val Asn Ile Ile Gly Arg Asn Leu Leu Thr Gln Ile Gly Cys Thr

85 90 95
Leu Asn Phe Pro Ile Ser Pro Ile Glu Thr Val Pro Val Lys Leu Lys
100 105 110
Pro Gly Met Asp Gly Pro Lys Val Lys Gln Trp Pro Leu Thr Glu Glu
115 120 125
Lys Ile Lys Ala Leu Val Glu Ile Cys Thr Glu Met Glu Lys Glu Gly
130 135 140
Lys Ile Ser Lys Ile Gly Pro Glu Asn Pro Tyr Asn Thr Pro Val Phe

145 150 155 160
Ala Ile Lys Lys Lys Asp Ser Thr Lys Trp Arg Lys Leu Val Asp Phe
165 170 175
Arg Glu Leu Asn Lys Arg Thr Gln Asp Phe Trp Glu Val Gln Leu Gly
180 185 190
Ile Pro His Pro Ala Gly Leu Lys Lys Lys Lys Ser Val Thr Val Leu

195 200 205

Asp Val Gly Asp Ala Tyr Phe Ser Val Pro Leu Asp Lys Asp Phe Arg

210 215 220

Lys Tyr Thr Ala Phe Thr Ile Pro Ser Ile Asn Asn Glu Thr Pro Gly

225 230 235 240

Ile Arg Tyr Gln Tyr Asn Val Leu Pro Gln Gly Trp Lys Gly Ser Pro

245 250 255

Ala Ile Phe Gln Ser Ser Met Thr Lys Ile Leu Glu Pro Phe Arg Lys

260 265 270

Gln Asn Pro Asp Ile Val Ile Tyr Gln Tyr Met Asp Asp Leu Tyr Val

275 280 285

Gly Ser Asp Leu Glu Ile Gly Gln His Arg Thr Lys Ile Glu Glu Leu

290 295 300

Arg Gln His Leu Leu Lys Trp Gly Phe Thr Thr Pro Asp Lys Lys His

305 310 315 320

Gln Lys Glu Pro Pro Phe Leu Trp Met Gly Tyr Glu Leu His Pro Asp

325 330 335

Lys Trp Thr Val Gln Pro Ile Val Leu Pro Glu Lys Asp Ser Trp Thr

340 345 350

Val Asn Asp Ile Gln Lys Leu Val Gly Lys Leu Asn Trp Ala Ser Gln

355 360 365

Ile Tyr His Gly Gln Val Asp Cys Ser Pro Gly Ile Trp Gln Leu Asp

370 375 380

Cys Thr His Leu Glu Gly Lys Val Ile Leu Val Ala Val His Val Ala

385 390 395 400

Ser Gly Tyr Ile Glu Ala Glu Val Ile Pro Ala Glu Thr Gly Gln Glu

405 410 415

Thr Ala Tyr Phe Leu Leu Lys Leu Ala Gly Arg Trp Pro Val Lys Val

420 425 430

Ile His Thr Asp Asn Gly Ser Asn Phe Thr Ser Ala Ala Val Lys Ala

435 440 445

Ala Cys Trp Trp Ala Gly Ile Lys Gln Glu Phe Gly Ile Pro Tyr Asn
450 455 460
Pro Gln Ser Gln Gly Val Val Glu Ser Met Asn Lys Glu Leu Lys Lys

465 470 475 480
Ile Ile Gly Gln Val Arg Asp Gln Ala Glu His Leu Lys Thr Ala Val
485 490 495
Gln Met Ala Val Phe Ile His Asn Phe Lys Arg Lys Gly Gly Ile Gly
500 505 510
Gly Tyr Ser Ala Gly Glu Arg Ile Ile Asp Ile Ile Ala Thr Asp Ile
515 520 525
Gln Thr Lys Glu Leu Gln Lys Gln Ile Thr Lys Ile Gln Asn Phe Arg

530 535 540
Val Tyr Tyr Arg Asp Ser Arg Asp Pro Ile Trp Lys Gly Pro Ala Lys
545 550 555 560
Leu Leu Trp Lys Gly Glu Gly Ala Val Val Ile Gln Asp Asn Ser Asp
565 570 575
Ile Lys Val Val Pro Arg Arg Lys Ala Lys Ile Ile Arg Asp Tyr Gly
580 585 590
Lys Gln Met Ala Gly Asp Asp Cys Val Ala Gly Arg Gln Asp Glu Asp

595 600 605
Gln

<210> 728
<211> 1003
<212> PRT
<213> Artificial Sequence
<220><223> HIV M pol Epigraph2
<400> 728
Phe Phe Arg Glu Asp Leu Ala Phe Pro Gln Gly Lys Ala Arg Glu Phe
1 5 10 15
Pro Ser Glu Gln Thr Arg Ala Asn Ser Pro Thr Arg Gly Glu Leu Gln
20 25 30

Val Trp Gly Gly Asp Asn Asn Ser Pro Ser Glu Ala Gly Ala Asp Arg

35 40 45

Gln Gly Thr Val Ser Phe Ser Phe Pro Gln Ile Thr Leu Trp Gln Arg

50 55 60

Pro Leu Val Ser Ile Lys Val Gly Gly Gln Ile Lys Glu Ala Leu Leu

65 70 75 80

Asp Thr Gly Ala Asp Asp Thr Val Leu Glu Glu Met Asn Leu Pro Gly

85 90 95

Arg Trp Lys Pro Lys Met Ile Gly Gly Ile Gly Gly Phe Ile Lys Val

100 105 110

Arg Gln Tyr Asp Gln Ile Pro Ile Glu Ile Cys Gly His Lys Ala Ile

115 120 125

Gly Thr Val Leu Ile Gly Pro Thr Pro Val Asn Ile Ile Gly Arg Asn

130 135 140

Met Leu Thr Gln Leu Gly Cys Thr Leu Asn Phe Pro Ile Ser Pro Ile

145 150 155 160

Asp Thr Val Pro Val Thr Leu Lys Pro Gly Met Asp Gly Pro Arg Val

165 170 175

Lys Gln Trp Pro Leu Thr Glu Glu Lys Ile Lys Ala Leu Thr Glu Ile

180 185 190

Cys Lys Glu Met Glu Lys Glu Gly Lys Ile Thr Lys Ile Gly Pro Glu

195 200 205

Asn Pro Tyr Asn Thr Pro Ile Phe Ala Ile Lys Lys Lys Asp Ser Thr

210 215 220

Lys Trp Arg Lys Leu Val Asp Phe Arg Glu Leu Asn Lys Lys Thr Gln

225 230 235 240

Asp Phe Trp Glu Val Gln Leu Gly Ile Pro His Pro Ala Gly Leu Lys

245 250 255

Lys Lys Lys Ser Val Thr Val Leu Asp Val Gly Asp Ala Tyr Phe Ser

260 265 270

Val Pro Leu Asp Glu Ser Phe Arg Lys Tyr Thr Ala Phe Thr Ile Pro

275 280 285

Ser Thr Asn Asn Glu Thr Pro Gly Ile Arg Tyr Gln Tyr Asn Val Leu

290 295 300

Pro Gln Gly Trp Lys Gly Ser Pro Ala Ile Phe Gln Cys Ser Met Thr

305 310 315 320

Lys Ile Leu Glu Pro Phe Arg Ile Lys Asn Pro Glu Ile Val Ile Tyr

325 330 335

Gln Tyr Met Asp Asp Leu Tyr Val Gly Ser Asp Leu Glu Ile Gly Gln

340 345 350

His Arg Ala Lys Ile Glu Glu Leu Arg Glu His Leu Leu Arg Trp Gly

355 360 365

Phe Thr Thr Pro Asp Lys Lys His Gln Lys Glu Pro Pro Phe Leu Trp

370 375 380

Met Gly Tyr Glu Leu His Pro Asp Arg Trp Thr Val Gln Pro Ile Glu

385 390 395 400

Leu Pro Glu Lys Asp Ser Trp Thr Val Asn Asp Ile Gln Lys Leu Val

405 410 415

Gly Lys Leu Asn Trp Ala Ser Gln Ile Tyr Ala Gly Ile Lys Val Arg

420 425 430

Gln Leu Cys Lys Leu Leu Arg Gly Thr Lys Ala Leu Thr Glu Val Val

435 440 445

Pro Leu Thr Glu Glu Ala Glu Leu Glu Leu Ala Glu Asn Arg Glu Ile

450 455 460

Leu Lys Thr Pro Val His Gly Val Tyr Tyr Asp Pro Ser Lys Asp Leu

465 470 475 480

Val Ala Glu Ile Gln Lys Gln Gly Gln Gly Gln Trp Thr Tyr Gln Ile

485 490 495

Tyr Gln Glu Pro Tyr Lys Asn Leu Lys Thr Gly Lys Tyr Ala Arg Lys

500 505 510

Arg Ser Ala His Thr Asn Asp Val Arg Gln Leu Thr Glu Val Val Gln

515 520 525

Lys Ile Ala Thr Glu Ser Ile Val Ile Trp Gly Lys Thr Pro Lys Phe
530 535 540
Lys Leu Pro Ile Gln Lys Glu Thr Trp Glu Ala Trp Trp Thr Asp Tyr

545 550 555 560
Trp Gln Ala Thr Trp Ile Pro Asp Trp Glu Phe Val Asn Thr Pro Pro
565 570 575
Leu Val Lys Leu Trp Tyr Gln Leu Glu Lys Asp Pro Ile Val Gly Ala
580 585 590
Glu Thr Phe Tyr Val Asp Gly Ala Ala Ser Arg Glu Thr Lys Leu Gly
595 600 605
Lys Ala Gly Tyr Val Thr Asn Arg Gly Arg Gln Lys Val Val Ser Leu

610 615 620
Thr Asp Thr Thr Asn Gln Lys Thr Glu Leu His Ala Ile His Leu Ala
625 630 635 640
Leu Gln Asp Ser Gly Leu Glu Val Asn Ile Val Thr Asp Ser Gln Tyr
645 650 655
Ala Leu Gly Ile Ile Gln Ala Gln Pro Asp Arg Ser Glu Ser Glu Val
660 665 670
Val Asn Gln Ile Ile Glu Glu Leu Ile Lys Lys Glu Lys Val Tyr Leu

675 680 685
Ala Trp Val Pro Ala His Lys Gly Ile Gly Gly Asn Glu Gln Val Asp
690 695 700
Lys Leu Val Ser Ala Gly Ile Arg Lys Val Leu Phe Leu Asp Gly Ile
705 710 715 720
Asp Lys Ala Gln Glu Glu His Glu Arg Tyr His Ser Asn Trp Arg Thr
725 730 735
Met Ala Ser Asp Phe Asn Leu Pro Pro Val Val Ala Lys Glu Ile Val

740 745 750
Ala Asn Cys Asp Lys Cys Gln Leu Lys Gly Glu Ala Ile His Gly Gln
755 760 765
Val Asp Cys Ser Pro Gly Met Trp Gln Leu Asp Cys Thr His Leu Glu

770 775 780

Gly Lys Ile Ile Leu Val Ala Val His Val Ala Ser Gly Tyr Met Glu

785 790 795 800

Ala Glu Val Ile Pro Ala Glu Thr Gly Gln Glu Thr Ala Tyr Phe Ile

805 810 815

Leu Lys Leu Ala Gly Arg Trp Pro Val Lys Thr Ile His Thr Asp Asn

820 825 830

Gly Ser Asn Phe Thr Ser Thr Thr Val Lys Ala Ala Cys Trp Trp Ala

835 840 845

Gly Ile Gln Gln Glu Phe Gly Ile Pro Tyr Asn Pro Gln Ser Gln Gly

850 855 860

Val Val Glu Ser Met Asn Asn Glu Leu Lys Lys Ile Ile Gly Gln Val

865 870 875 880

Arg Glu Gln Ala Glu His Leu Lys Thr Ala Val Gln Met Ala Val Phe

885 890 895

Ile His Asn Phe Lys Arg Arg Gly Gly Ile Gly Gly Tyr Ser Ala Gly

900 905 910

Glu Arg Ile Val Asp Ile Ile Ala Thr Asp Ile Gln Thr Arg Glu Leu

915 920 925

Gln Lys Gln Ile Ile Lys Ile Gln Asn Phe Arg Val Tyr Tyr Arg Asp

930 935 940

Ser Arg Asp Pro Leu Trp Lys Gly Pro Ala Lys Leu Leu Trp Lys Gly

945 950 955 960

Glu Gly Ala Val Val Ile Gln Asp Asn Ser Glu Ile Lys Val Val Pro

965 970 975

Arg Arg Lys Val Lys Ile Ile Lys Asp Tyr Gly Lys Gln Met Ala Gly

980 985 990

Asp Asp Cys Val Ala Ser Arg Gln Asp Glu Asp

995 1000

<210> 729

<211> 608

<212> PRT

<213> Artificial Sequence

<220><223> HIV M pol Epigraph2 Conserved

<400> 729

Pro Gln Ile Thr Leu Trp Gln Arg Pro Leu Val Ser Ile Lys Val Gly
1 5 10 15

Gly Gln Ile Lys Glu Ala Leu Leu Asp Thr Gly Ala Asp Asp Thr Val
20 25 30

Leu Glu Glu Met Asn Leu Pro Gly Arg Trp Lys Pro Lys Met Ile Gly
35 40 45

Gly Ile Gly Gly Phe Ile Lys Val Arg Gln Tyr Asp Gln Ile Pro Ile
50 55 60

Glu Ile Cys Gly His Lys Ala Ile Gly Thr Val Leu Ile Gly Pro Thr
65 70 75 80

Pro Val Asn Ile Ile Gly Arg Asn Met Leu Thr Gln Leu Gly Cys Thr
85 90 95

Leu Asn Phe Pro Ile Ser Pro Ile Asp Thr Val Pro Val Thr Leu Lys
100 105 110

Pro Gly Met Asp Gly Pro Arg Val Lys Gln Trp Pro Leu Thr Glu Glu
115 120 125

Lys Ile Lys Ala Leu Thr Glu Ile Cys Lys Glu Met Glu Lys Glu Gly
130 135 140

Lys Ile Thr Lys Ile Gly Pro Glu Asn Pro Tyr Asn Thr Pro Ile Phe
145 150 155 160

Ala Ile Lys Lys Lys Asp Ser Thr Lys Trp Arg Lys Leu Val Asp Phe
165 170 175

Arg Glu Leu Asn Lys Lys Thr Gln Asp Phe Trp Glu Val Gln Leu Gly
180 185 190

Ile Pro His Pro Ala Gly Leu Lys Lys Lys Lys Ser Val Thr Val Leu
195 200 205

Asp Val Gly Asp Ala Tyr Phe Ser Val Pro Leu Asp Glu Ser Phe Arg
210 215 220

Lys Tyr Thr Ala Phe Thr Ile Pro Ser Thr Asn Asn Glu Thr Pro Gly
225 230 235 240

Ile Arg Tyr Gln Tyr Asn Val Leu Pro Gln Gly Trp Lys Gly Ser Pro
245 250 255

Ala Ile Phe Gln Cys Ser Met Thr Lys Ile Leu Glu Pro Phe Arg Ile
260 265 270

Lys Asn Pro Glu Ile Val Ile Tyr Gln Tyr Met Asp Asp Leu Tyr Val
275 280 285

Gly Ser Asp Leu Glu Ile Gly Gln His Arg Ala Lys Ile Glu Glu Leu
290 295 300

Arg Glu His Leu Leu Arg Trp Gly Phe Thr Thr Pro Asp Lys Lys His
305 310 315 320

Gln Lys Glu Pro Pro Phe Leu Trp Met Gly Tyr Glu Leu His Pro Asp
325 330 335

Arg Trp Thr Val Gln Pro Ile Glu Leu Pro Glu Lys Asp Ser Trp Thr
340 345 350

Val Asn Asp Ile Gln Lys Leu Val Gly Lys Leu Asn Trp Ala Ser Gln
355 360 365

Ile Tyr His Gly Gln Val Asp Cys Ser Pro Gly Met Trp Gln Leu Asp
370 375 380

Cys Thr His Leu Glu Gly Lys Ile Ile Leu Val Ala Val His Val Ala
385 390 395 400

Ser Gly Tyr Met Glu Ala Glu Val Ile Pro Ala Glu Thr Gly Gln Glu
405 410 415

Thr Ala Tyr Phe Ile Leu Lys Leu Ala Gly Arg Trp Pro Val Lys Thr
420 425 430

Ile His Thr Asp Asn Gly Ser Asn Phe Thr Ser Thr Thr Val Lys Ala
435 440 445

Ala Cys Trp Trp Ala Gly Ile Gln Gln Glu Phe Gly Ile Pro Tyr Asn
450 455 460

Pro Gln Ser Gln Gly Val Val Glu Ser Met Asn Asn Glu Leu Lys Lys

465 470 475 480

Ile Ile Gly Gln Val Arg Glu Gln Ala Glu His Leu Lys Thr Ala Val

485 490 495

Gln Met Ala Val Phe Ile His Asn Phe Lys Arg Arg Gly Gly Ile Gly

500 505 510

Gly Tyr Ser Ala Gly Glu Arg Ile Val Asp Ile Ile Ala Thr Asp Ile

515 520 525

Gln Thr Arg Glu Leu Gln Lys Gln Ile Ile Lys Ile Gln Asn Phe Arg

530 535 540

Val Tyr Tyr Arg Asp Ser Arg Asp Pro Leu Trp Lys Gly Pro Ala Lys

545 550 555 560

Leu Leu Trp Lys Gly Glu Gly Ala Val Val Ile Gln Asp Asn Ser Glu

565 570 575

Ile Lys Val Val Pro Arg Arg Lys Val Lys Ile Ile Lys Asp Tyr Gly

580 585 590

Lys Gln Met Ala Gly Asp Asp Cys Val Ala Ser Arg Gln Asp Glu Asp

595 600 605

<210> 730

<211> 500

<212> PRT

<213> Artificial Sequence

<220><223> HIV B gag Epigraph1

<400> 730

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110
Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140
Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160
Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile
245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala
325 330 335
Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg
370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His
385 390 395 400
Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys
405 410 415
Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn
420 425 430
Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe
435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Glu Ser Phe Arg
450 455 460
Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu Pro Ile Asp
465 470 475 480
Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser Gln
500

<210> 731
<211> 231
<212> PRT
<213> Artificial Sequence
<220><223> HIV B gag Epigraph1 Conserved

<400> 731

Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln Ala Ile Ser
1 5 10 15
Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys Ala Phe
20 25 30
Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu Gly Ala Thr
35 40 45
Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His Gln Ala
50 55 60

Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp
65 70 75 80
Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala Pro Gly Gln Met
85 90 95
Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln
100 105 110
Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro Val Gly Glu
115 120 125

Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg Met
130 135 140
Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro
145 150 155 160
Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln
165 170 175
Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln
180 185 190

Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro Ala
195 200 205
Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro
210 215 220
Gly His Lys Ala Arg Val Leu
225 230
<210> 732
<211> 499

<212> PRT

<213> Artificial Sequence

<220><223> HIV B gag Epigraph2

<400> 732

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Arg Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Asn Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His
130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Ile Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Asp Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Val Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Asn Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg

450 455 460

Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp
465 470 475 480
Lys Asp Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp
485 490 495
Pro Ser Ser

<210> 733
<211> 231
<212> PRT
<213> Artificial Sequence
<220><223> HIV B gag Epigraph2 Conserved
<400> 733
Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His Gln Pro Ile Ser
1 5 10 15

Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys Ala Phe
20 25 30
Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser Glu Gly Ala Thr
35 40 45
Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His Gln Ala
50 55 60
Ala Met Gln Ile Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala Asp Trp
65 70 75 80

Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala Pro Gly Gln Met
85 90 95
Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Asn Leu Gln
100 105 110
Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile Pro Val Gly Glu
115 120 125
Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys Ile Val Arg Met
130 135 140

Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly Pro Lys Glu Pro
145 150 155 160

Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Val Leu Arg Ala Glu Gln
165 170 175
Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln
180 185 190
Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro Gly
195 200 205

Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro
210 215 220
Ser His Lys Ala Arg Ile Leu
225 230

<210> 734
<211> 206
<212> PRT
<213> Artificial Sequence
<220><223> HIV B nef Epigraph1
<400> 734
Met Gly Gly Lys Trp Ser Lys Ser Ser Ile Val Gly Trp Pro Ala Val
1 5 10 15
Arg Glu Arg Met Arg Arg Ala Glu Pro Ala Ala Glu Gly Val Gly Ala
20 25 30

Val Ser Arg Asp Leu Glu Lys His Gly Ala Ile Thr Ser Ser Asn Thr
35 40 45
Ala Ala Thr Asn Ala Asp Cys Ala Trp Leu Glu Ala Gln Glu Glu Glu
50 55 60
Glu Val Gly Phe Pro Val Arg Pro Gln Val Pro Leu Arg Pro Met Thr
65 70 75 80
Tyr Lys Gly Ala Leu Asp Leu Ser His Phe Leu Lys Glu Lys Gly Gly
85 90 95

Leu Glu Gly Leu Ile Tyr Ser Gln Lys Arg Gln Asp Ile Leu Asp Leu
100 105 110
Trp Val Tyr His Thr Gln Gly Tyr Phe Pro Asp Trp Gln Asn Tyr Thr
115 120 125

Pro Gly Pro Gly Ile Arg Tyr Pro Leu Thr Phe Gly Trp Cys Phe Lys
130 135 140
Leu Val Pro Val Glu Pro Glu Lys Val Glu Glu Ala Asn Glu Gly Glu
145 150 155 160

Asn Asn Ser Leu Leu His Pro Met Ser Gln His Gly Met Asp Asp Pro
165 170 175
Glu Lys Glu Val Leu Met Trp Lys Phe Asp Ser Arg Leu Ala Phe His
180 185 190
His Met Ala Arg Glu Leu His Pro Glu Tyr Tyr Lys Asp Cys
195 200 205

<210> 735
<211> 81
<212> PRT
<213> Artificial Sequence
<220><223> HIV B nef Epigraph1 Conserved
<400> 735
Gly Phe Pro Val Arg Pro Gln Val Pro Leu Arg Pro Met Thr Tyr Lys

1 5 10 15
Gly Ala Leu Asp Leu Ser His Phe Leu Lys Glu Lys Gly Gly Leu Glu
20 25 30
Gly Leu Ile Tyr Ser Gln Lys Arg Gln Asp Ile Leu Asp Leu Trp Val
35 40 45
Tyr His Thr Gln Gly Tyr Phe Pro Asp Trp Gln Asn Tyr Thr Pro Gly
50 55 60
Pro Gly Ile Arg Tyr Pro Leu Thr Phe Gly Trp Cys Phe Lys Leu Val

65 70 75 80
Pro

<210> 736
<211> 206
<212> PRT
<213> Artificial Sequence

<220><223> HIV B nef Epigraph2

<400> 736

Met Gly Gly Lys Trp Ser Lys Ser Ser Val Val Gly Trp Pro Ala Ile
1 5 10 15

Arg Glu Arg Met Arg Arg Ala Glu Pro Ala Ala Asp Gly Val Gly Ala
20 25 30

Ala Ser Arg Asp Leu Glu Arg His Gly Ala Ile Thr Ser Ser Asn Thr
35 40 45

Ala Ala Asn Asn Ala Ala Cys Ala Trp Leu Glu Ala Gln Glu Asp Glu
50 55 60

Glu Val Gly Phe Pro Val Lys Pro Gln Val Pro Leu Arg Pro Met Thr
65 70 75 80

Tyr Lys Ala Ala Val Asp Leu Ser His Phe Leu Lys Glu Lys Gly Gly
85 90 95

Leu Glu Gly Leu Ile His Ser Gln Lys Arg Gln Glu Ile Leu Asp Leu
100 105 110

Trp Val Tyr His Thr Gln Gly Phe Phe Pro Asp Trp Gln Asn Tyr Thr
115 120 125

Pro Gly Pro Gly Thr Arg Phe Pro Leu Thr Phe Gly Trp Cys Phe Lys
130 135 140

Leu Val Pro Val Asp Pro Asp Lys Val Glu Glu Ala Asn Glu Gly Glu
145 150 155 160

Asn Asn Cys Leu Leu His Pro Met Ser Leu His Gly Met Asp Asp Pro
165 170 175

Glu Arg Glu Val Leu Val Trp Lys Phe Asp Ser Arg Leu Ala Phe His
180 185 190

His Val Ala Arg Glu Leu His Pro Glu Tyr Tyr Lys Asn Cys
195 200 205

<210> 737

<211> 81

<212> PRT

<213> Artificial Sequence

<220><223> HIV B nef Epigraph2 Conserved

<400> 737

Gly Phe Pro Val Lys Pro Gln Val Pro Leu Arg Pro Met Thr Tyr Lys
1 5 10 15

Ala Ala Val Asp Leu Ser His Phe Leu Lys Glu Lys Gly Gly Leu Glu
20 25 30

Gly Leu Ile His Ser Gln Lys Arg Gln Glu Ile Leu Asp Leu Trp Val
35 40 45

Tyr His Thr Gln Gly Phe Phe Pro Asp Trp Gln Asn Tyr Thr Pro Gly
50 55 60

Pro Gly Thr Arg Phe Pro Leu Thr Phe Gly Trp Cys Phe Lys Leu Val
65 70 75 80

Pro

<210> 738

<211> 1003

<212> PRT

<213> Artificial Sequence

<220><223> HIV B pol Epigraph1

<400> 738

Phe Phe Arg Glu Asn Leu Ala Phe Pro Gln Gly Lys Ala Arg Glu Phe
1 5 10 15

Ser Ser Glu Gln Thr Arg Ala Asn Ser Pro Thr Arg Arg Glu Leu Gln
20 25 30

Val Trp Gly Arg Asp Asn Asn Ser Leu Ser Glu Ala Gly Ala Asp Arg
35 40 45

Gln Gly Thr Val Ser Phe Ser Phe Pro Gln Ile Thr Leu Trp Gln Arg
50 55 60

Pro Leu Val Thr Ile Lys Ile Gly Gly Gln Leu Lys Glu Ala Leu Leu
65 70 75 80

Asp Thr Gly Ala Asp Asp Thr Val Leu Glu Glu Met Asn Leu Pro Gly
85 90 95

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Arg Trp Lys Pro Lys Met Ile Gly Gly Ile Gly Gly Phe Ile Lys Val
            100                 105                 110

Arg Gln Tyr Asp Gln Ile Pro Ile Glu Ile Cys Gly His Lys Ala Ile
        115                 120                 125
Gly Thr Val Leu Val Gly Pro Thr Pro Val Asn Ile Ile Gly Arg Asn
    130                 135                 140
Leu Leu Thr Gln Ile Gly Cys Thr Leu Asn Phe Pro Ile Ser Pro Ile
145                 150                 155                 160
Glu Thr Val Pro Val Lys Leu Lys Pro Gly Met Asp Gly Pro Lys Val
                165                 170                 175

Lys Gln Trp Pro Leu Thr Glu Glu Lys Ile Lys Ala Leu Val Glu Ile
            180                 185                 190
Cys Thr Glu Met Glu Lys Glu Gly Lys Ile Ser Lys Ile Gly Pro Glu
        195                 200                 205
Asn Pro Tyr Asn Thr Pro Val Phe Ala Ile Lys Lys Lys Asp Ser Thr
    210                 215                 220
Lys Trp Arg Lys Leu Val Asp Phe Arg Glu Leu Asn Lys Arg Thr Gln
225                 230                 235                 240

Asp Phe Trp Glu Val Gln Leu Gly Ile Pro His Pro Ala Gly Leu Lys
                245                 250                 255
Lys Lys Lys Ser Val Thr Val Leu Asp Val Gly Asp Ala Tyr Phe Ser
            260                 265                 270
Val Pro Leu Asp Lys Asp Phe Arg Lys Tyr Thr Ala Phe Thr Ile Pro
        275                 280                 285
Ser Ile Asn Asn Glu Thr Pro Gly Ile Arg Tyr Gln Tyr Asn Val Leu
    290                 295                 300

Pro Gln Gly Trp Lys Gly Ser Pro Ala Ile Phe Gln Ser Ser Met Thr
305                 310                 315                 320
Lys Ile Leu Glu Pro Phe Arg Lys Gln Asn Pro Asp Ile Val Ile Tyr
                325                 330                 335
Gln Tyr Met Asp Asp Leu Tyr Val Gly Ser Asp Leu Glu Ile Gly Gln
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340 345 350

His Arg Thr Lys Ile Glu Glu Leu Arg Gln His Leu Leu Arg Trp Gly

355 360 365

Phe Thr Thr Pro Asp Lys Lys His Gln Lys Glu Pro Pro Phe Leu Trp

370 375 380

Met Gly Tyr Glu Leu His Pro Asp Lys Trp Thr Val Gln Pro Ile Val

385 390 395 400

Leu Pro Glu Lys Asp Ser Trp Thr Val Asn Asp Ile Gln Lys Leu Val

405 410 415

Gly Lys Leu Asn Trp Ala Ser Gln Ile Tyr Ala Gly Ile Lys Val Lys

420 425 430

Gln Leu Cys Lys Leu Leu Arg Gly Thr Lys Ala Leu Thr Glu Val Val

435 440 445

Pro Leu Thr Glu Glu Ala Glu Leu Glu Leu Ala Glu Asn Arg Glu Ile

450 455 460

Leu Lys Glu Pro Val His Gly Val Tyr Tyr Asp Pro Ser Lys Asp Leu

465 470 475 480

Ile Ala Glu Ile Gln Lys Gln Gly Gln Gly Gln Trp Thr Tyr Gln Ile

485 490 495

Tyr Gln Glu Pro Phe Lys Asn Leu Lys Thr Gly Lys Tyr Ala Arg Met

500 505 510

Arg Gly Ala His Thr Asn Asp Val Lys Gln Leu Thr Glu Ala Val Gln

515 520 525

Lys Ile Ala Thr Glu Ser Ile Val Ile Trp Gly Lys Thr Pro Lys Phe

530 535 540

Lys Leu Pro Ile Gln Lys Glu Thr Trp Glu Ala Trp Trp Thr Glu Tyr

545 550 555 560

Trp Gln Ala Thr Trp Ile Pro Glu Trp Glu Phe Val Asn Thr Pro Pro

565 570 575

Leu Val Lys Leu Trp Tyr Gln Leu Glu Lys Glu Pro Ile Val Gly Ala

580 585 590

Glu Thr Phe Tyr Val Asp Gly Ala Ala Asn Arg Glu Thr Lys Leu Gly
595 600 605
Lys Ala Gly Tyr Val Thr Asp Arg Gly Arg Gln Lys Val Val Ser Leu
610 615 620

Thr Asp Thr Thr Asn Gln Lys Thr Glu Leu Gln Ala Ile His Leu Ala
625 630 635 640
Leu Gln Asp Ser Gly Leu Glu Val Asn Ile Val Thr Asp Ser Gln Tyr
645 650 655
Ala Leu Gly Ile Ile Gln Ala Gln Pro Asp Lys Ser Glu Ser Glu Leu
660 665 670
Val Ser Gln Ile Ile Glu Gln Leu Ile Lys Lys Glu Lys Val Tyr Leu
675 680 685

Ala Trp Val Pro Ala His Lys Gly Ile Gly Gly Asn Glu Gln Val Asp
690 695 700
Lys Leu Val Ser Ala Gly Ile Arg Lys Val Leu Phe Leu Asp Gly Ile
705 710 715 720
Asp Lys Ala Gln Glu Glu His Glu Lys Tyr His Ser Asn Trp Arg Ala
725 730 735
Met Ala Ser Asp Phe Asn Leu Pro Pro Val Val Ala Lys Glu Ile Val
740 745 750

Ala Ser Cys Asp Lys Cys Gln Leu Lys Gly Glu Ala Met His Gly Gln
755 760 765
Val Asp Cys Ser Pro Gly Ile Trp Gln Leu Asp Cys Thr His Leu Glu
770 775 780
Gly Lys Ile Ile Leu Val Ala Val His Val Ala Ser Gly Tyr Ile Glu
785 790 795 800
Ala Glu Val Ile Pro Ala Glu Thr Gly Gln Glu Thr Ala Tyr Phe Leu
805 810 815

Leu Lys Leu Ala Gly Arg Trp Pro Val Lys Thr Ile His Thr Asp Asn
820 825 830
Gly Ser Asn Phe Thr Ser Thr Thr Val Lys Ala Ala Cys Trp Trp Ala

835 840 845

Gly Ile Lys Gln Glu Phe Gly Ile Pro Tyr Asn Pro Gln Ser Gln Gly

850 855 860

Val Val Glu Ser Met Asn Lys Glu Leu Lys Lys Ile Ile Gly Gln Val

865 870 875 880

Arg Asp Gln Ala Glu His Leu Lys Thr Ala Val Gln Met Ala Val Phe

885 890 895

Ile His Asn Phe Lys Arg Lys Gly Gly Ile Gly Gly Tyr Ser Ala Gly

900 905 910

Glu Arg Ile Val Asp Ile Ile Ala Thr Asp Ile Gln Thr Lys Glu Leu

915 920 925

Gln Lys Gln Ile Thr Lys Ile Gln Asn Phe Arg Val Tyr Tyr Arg Asp

930 935 940

Ser Arg Asp Pro Leu Trp Lys Gly Pro Ala Lys Leu Leu Trp Lys Gly

945 950 955 960

Glu Gly Ala Val Val Ile Gln Asp Asn Ser Asp Ile Lys Val Val Pro

965 970 975

Arg Arg Lys Ala Lys Ile Ile Arg Asp Tyr Gly Lys Gln Met Ala Gly

980 985 990

Asp Asp Cys Val Ala Ser Arg Gln Asp Glu Asp

995 1000

<210> 739

<211> 608

<212> PRT

<213> Artificial Sequence

<220><223> HIV B pol Epigraph1 Conserved

<400> 739

Pro Gln Ile Thr Leu Trp Gln Arg Pro Leu Val Thr Ile Lys Ile Gly

1 5 10 15

Gly Gln Leu Lys Glu Ala Leu Leu Asp Thr Gly Ala Asp Asp Thr Val

20 25 30

Leu Glu Glu Met Asn Leu Pro Gly Arg Trp Lys Pro Lys Met Ile Gly

35 40 45

Gly Ile Gly Gly Phe Ile Lys Val Arg Gln Tyr Asp Gln Ile Pro Ile

50 55 60

Glu Ile Cys Gly His Lys Ala Ile Gly Thr Val Leu Val Gly Pro Thr

65 70 75 80

Pro Val Asn Ile Ile Gly Arg Asn Leu Leu Thr Gln Ile Gly Cys Thr

85 90 95

Leu Asn Phe Pro Ile Ser Pro Ile Glu Thr Val Pro Val Lys Leu Lys

100 105 110

Pro Gly Met Asp Gly Pro Lys Val Lys Gln Trp Pro Leu Thr Glu Glu

115 120 125

Lys Ile Lys Ala Leu Val Glu Ile Cys Thr Glu Met Glu Lys Glu Gly

130 135 140

Lys Ile Ser Lys Ile Gly Pro Glu Asn Pro Tyr Asn Thr Pro Val Phe

145 150 155 160

Ala Ile Lys Lys Lys Asp Ser Thr Lys Trp Arg Lys Leu Val Asp Phe

165 170 175

Arg Glu Leu Asn Lys Arg Thr Gln Asp Phe Trp Glu Val Gln Leu Gly

180 185 190

Ile Pro His Pro Ala Gly Leu Lys Lys Lys Lys Ser Val Thr Val Leu

195 200 205

Asp Val Gly Asp Ala Tyr Phe Ser Val Pro Leu Asp Lys Asp Phe Arg

210 215 220

Lys Tyr Thr Ala Phe Thr Ile Pro Ser Ile Asn Asn Glu Thr Pro Gly

225 230 235 240

Ile Arg Tyr Gln Tyr Asn Val Leu Pro Gln Gly Trp Lys Gly Ser Pro

245 250 255

Ala Ile Phe Gln Ser Ser Met Thr Lys Ile Leu Glu Pro Phe Arg Lys

260 265 270

Gln Asn Pro Asp Ile Val Ile Tyr Gln Tyr Met Asp Asp Leu Tyr Val

275 280 285

Gly Ser Asp Leu Glu Ile Gly Gln His Arg Thr Lys Ile Glu Glu Leu

290 295 300

Arg Gln His Leu Leu Arg Trp Gly Phe Thr Thr Pro Asp Lys Lys His

305 310 315 320

Gln Lys Glu Pro Pro Phe Leu Trp Met Gly Tyr Glu Leu His Pro Asp

325 330 335

Lys Trp Thr Val Gln Pro Ile Val Leu Pro Glu Lys Asp Ser Trp Thr

340 345 350

Val Asn Asp Ile Gln Lys Leu Val Gly Lys Leu Asn Trp Ala Ser Gln

355 360 365

Ile Tyr His Gly Gln Val Asp Cys Ser Pro Gly Ile Trp Gln Leu Asp

370 375 380

Cys Thr His Leu Glu Gly Lys Ile Ile Leu Val Ala Val His Val Ala

385 390 395 400

Ser Gly Tyr Ile Glu Ala Glu Val Ile Pro Ala Glu Thr Gly Gln Glu

405 410 415

Thr Ala Tyr Phe Leu Leu Lys Leu Ala Gly Arg Trp Pro Val Lys Thr

420 425 430

Ile His Thr Asp Asn Gly Ser Asn Phe Thr Ser Thr Thr Val Lys Ala

435 440 445

Ala Cys Trp Trp Ala Gly Ile Lys Gln Glu Phe Gly Ile Pro Tyr Asn

450 455 460

Pro Gln Ser Gln Gly Val Val Glu Ser Met Asn Lys Glu Leu Lys Lys

465 470 475 480

Ile Ile Gly Gln Val Arg Asp Gln Ala Glu His Leu Lys Thr Ala Val

485 490 495

Gln Met Ala Val Phe Ile His Asn Phe Lys Arg Lys Gly Gly Ile Gly

500 505 510

Gly Tyr Ser Ala Gly Glu Arg Ile Val Asp Ile Ile Ala Thr Asp Ile

515 520 525

Gln Thr Lys Glu Leu Gln Lys Gln Ile Thr Lys Ile Gln Asn Phe Arg

530 535 540

Val Tyr Tyr Arg Asp Ser Arg Asp Pro Leu Trp Lys Gly Pro Ala Lys

545 550 555 560

Leu Leu Trp Lys Gly Glu Gly Ala Val Val Ile Gln Asp Asn Ser Asp

565 570 575

Ile Lys Val Val Pro Arg Arg Lys Ala Lys Ile Ile Arg Asp Tyr Gly

580 585 590

Lys Gln Met Ala Gly Asp Asp Cys Val Ala Ser Arg Gln Asp Glu Asp

595 600 605

<210> 740

<211> 1003

<212> PRT

<213> Artificial Sequence

<220><223> HIV B pol Epigraph2

<400> 740

Phe Phe Arg Glu Asp Leu Ala Phe Pro Gln Gly Glu Ala Arg Glu Phe

1 5 10 15

Pro Ser Glu Gln Thr Arg Ala Asn Ser Pro Thr Arg Gly Glu Leu Gln

20 25 30

Val Trp Gly Gly Asp Asn Asn Ser Pro Ser Glu Ala Gly Ala Asp Arg

35 40 45

Gln Gly Thr Val Ser Leu Ser Phe Pro Gln Ile Thr Leu Trp Gln Arg

50 55 60

Pro Leu Val Thr Ile Lys Val Gly Gly Gln Leu Lys Glu Ala Leu Leu

65 70 75 80

Asp Thr Gly Ala Asp Asp Thr Val Leu Glu Asp Met Asn Leu Pro Gly

85 90 95

Lys Trp Lys Pro Lys Met Ile Gly Gly Ile Gly Gly Phe Ile Lys Val

100 105 110

Arg Gln Tyr Asp Gln Ile Leu Ile Glu Ile Cys Gly His Lys Ala Ile

115 120 125

Gly Thr Val Leu Ile Gly Pro Thr Pro Val Asn Ile Ile Gly Arg Asn

130 135 140

Leu Leu Thr Gln Leu Gly Cys Thr Leu Asn Phe Pro Ile Ser Pro Ile

145 150 155 160

Asp Thr Val Pro Val Lys Leu Lys Pro Gly Met Asp Gly Pro Arg Val

165 170 175

Lys Gln Trp Pro Leu Thr Glu Glu Lys Ile Lys Ala Leu Ile Glu Ile

180 185 190

Cys Thr Glu Met Glu Lys Glu Gly Lys Ile Ser Arg Ile Gly Pro Glu

195 200 205

Asn Pro Tyr Asn Thr Pro Ile Phe Ala Ile Lys Lys Lys Asp Ser Thr

210 215 220

Lys Trp Arg Lys Leu Val Asp Phe Arg Glu Leu Asn Lys Lys Thr Gln

225 230 235 240

Asp Phe Trp Glu Val Gln Leu Gly Ile Pro His Pro Ser Gly Leu Lys

245 250 255

Lys Lys Lys Ser Val Thr Val Leu Asp Val Gly Asp Ala Tyr Phe Ser

260 265 270

Val Pro Leu Asp Lys Glu Phe Arg Lys Tyr Thr Ala Phe Thr Ile Pro

275 280 285

Ser Thr Asn Asn Glu Thr Pro Gly Ile Arg Tyr Gln Tyr Asn Val Leu

290 295 300

Pro Gln Gly Trp Lys Gly Ser Pro Ala Ile Phe Gln Cys Ser Met Thr

305 310 315 320

Lys Ile Leu Glu Pro Phe Arg Lys Gln Asn Pro Glu Ile Val Ile Tyr

325 330 335

Gln Tyr Met Asp Asp Leu Tyr Val Gly Ser Asp Leu Glu Ile Glu Gln

340 345 350

His Arg Thr Lys Ile Glu Glu Leu Arg Gln His Leu Leu Lys Trp Gly

355 360 365

Phe Thr Thr Pro Asp Lys Lys His Gln Lys Glu Pro Pro Phe Leu Trp

370 375 380

Met Gly Tyr Glu Leu His Pro Asp Lys Trp Thr Val Gln Pro Ile Met

385 390 395 400

Leu Pro Glu Lys Asp Ser Trp Thr Val Asn Asp Ile Gln Lys Leu Val

405 410 415

Gly Lys Leu Asn Trp Ala Ser Gln Ile Tyr Pro Gly Ile Lys Val Arg

420 425 430

Gln Leu Cys Lys Leu Leu Arg Gly Ala Lys Ala Leu Thr Glu Val Ile

435 440 445

Pro Leu Thr Glu Glu Ala Glu Leu Glu Leu Ala Glu Asn Arg Glu Ile

450 455 460

Leu Arg Glu Pro Val His Gly Val Tyr Tyr Asp Pro Thr Lys Asp Leu

465 470 475 480

Ile Ala Glu Ile Gln Lys Gln Gly Leu Gly Gln Trp Thr Tyr Gln Ile

485 490 495

Tyr Gln Glu Pro Tyr Lys Asn Leu Lys Thr Gly Lys Tyr Ala Arg Thr

500 505 510

Arg Gly Ala His Thr Asn Asp Val Arg Gln Leu Thr Glu Ala Val Gln

515 520 525

Lys Ile Thr Thr Glu Ser Ile Val Ile Trp Gly Lys Thr Pro Lys Phe

530 535 540

Arg Leu Pro Ile Gln Lys Glu Thr Trp Glu Thr Trp Trp Thr Glu Tyr

545 550 555 560

Trp Gln Ala Thr Trp Ile Pro Glu Trp Glu Phe Val Asn Thr Pro Pro

565 570 575

Leu Val Lys Leu Trp Tyr Gln Leu Glu Lys Glu Pro Ile Ile Gly Ala

580 585 590

Glu Thr Phe Tyr Val Asp Gly Ala Ala Asn Arg Asp Thr Lys Leu Gly

595 600 605

Lys Ala Gly Tyr Val Thr Asn Lys Gly Arg Gln Lys Val Val Thr Leu

610 615 620

Thr Asp Thr Thr Asn Gln Lys Thr Glu Leu Gln Ala Ile Tyr Leu Ala
625 630 635 640
Leu Gln Asp Ser Gly Ser Glu Val Asn Ile Val Thr Asp Ser Gln Tyr

645 650 655
Ala Leu Gly Ile Ile Gln Ala Gln Pro Asp Lys Ser Glu Ser Glu Leu
660 665 670
Val Asn Gln Ile Ile Glu Gln Leu Ile Lys Lys Glu Lys Ile Tyr Leu
675 680 685
Ala Trp Val Pro Ala His Lys Gly Ile Gly Gly Asn Glu Gln Val Asp
690 695 700
Lys Leu Val Ser Ser Gly Ile Arg Lys Val Leu Phe Leu Asp Gly Ile

705 710 715 720
Asp Lys Ala Gln Glu Asp His Glu Lys Tyr His Ser Asn Trp Lys Ala
725 730 735
Met Ala Ser Asp Phe Asn Leu Pro Pro Ile Val Ala Lys Glu Ile Val
740 745 750
Ala Ser Cys Asp Lys Cys Gln Leu Lys Gly Glu Ala Ile His Gly Gln
755 760 765
Val Asp Cys Ser Pro Gly Ile Trp Gln Leu Asp Cys Thr His Leu Glu

770 775 780
Gly Lys Val Ile Leu Val Ala Val His Val Ala Ser Gly Tyr Ile Glu
785 790 795 800
Ala Glu Val Ile Pro Ala Glu Thr Gly Gln Glu Thr Ala Tyr Phe Ile
805 810 815
Leu Lys Leu Ala Gly Arg Trp Pro Val Lys Thr Val His Thr Asp Asn
820 825 830
Gly Ser Asn Phe Thr Ser Ala Thr Val Lys Ala Ala Cys Trp Trp Ala

835 840 845
Gly Val Lys Gln Glu Phe Gly Ile Pro Tyr Asn Pro Gln Ser Gln Gly
850 855 860
Val Val Glu Ser Met Asn Asn Glu Leu Lys Lys Ile Ile Gly Gln Ile

865 870 875 880

Arg Asp Gln Ala Glu His Leu Lys Thr Ala Val Gln Met Ala Val Phe

885 890 895

Ile His Asn Phe Lys Arg Lys Gly Gly Ile Gly Gly Tyr Ser Ala Gly

900 905 910

Glu Arg Ile Ile Asp Ile Ile Ala Thr Asp Ile Gln Thr Arg Glu Leu

915 920 925

Gln Lys Gln Ile Thr Lys Ile Gln Asn Phe Arg Val Tyr Tyr Arg Asp

930 935 940

Asn Arg Asp Pro Leu Trp Lys Gly Pro Ala Lys Leu Leu Trp Lys Gly

945 950 955 960

Glu Gly Ala Val Val Ile Gln Asp Asn Ser Glu Ile Lys Val Val Pro

965 970 975

Arg Arg Lys Val Lys Ile Ile Arg Asp Tyr Gly Lys Gln Met Ala Gly

980 985 990

Asp Asp Cys Val Ala Gly Arg Gln Asp Glu Asp

995 1000

<210> 741

<211> 608

<212> PRT

<213> Artificial Sequence

<220><223> HIV B pol Epigraph2 Conserved

<400> 741

Pro Gln Ile Thr Leu Trp Gln Arg Pro Leu Val Thr Ile Lys Val Gly

1 5 10 15

Gly Gln Leu Lys Glu Ala Leu Leu Asp Thr Gly Ala Asp Asp Thr Val

20 25 30

Leu Glu Asp Met Asn Leu Pro Gly Lys Trp Lys Pro Lys Met Ile Gly

35 40 45

Gly Ile Gly Gly Phe Ile Lys Val Arg Gln Tyr Asp Gln Ile Leu Ile

50 55 60

Glu Ile Cys Gly His Lys Ala Ile Gly Thr Val Leu Ile Gly Pro Thr

65 70 75 80

Pro Val Asn Ile Ile Gly Arg Asn Leu Leu Thr Gln Leu Gly Cys Thr
85 90 95
Leu Asn Phe Pro Ile Ser Pro Ile Asp Thr Val Pro Val Lys Leu Lys
100 105 110
Pro Gly Met Asp Gly Pro Arg Val Lys Gln Trp Pro Leu Thr Glu Glu
115 120 125
Lys Ile Lys Ala Leu Ile Glu Ile Cys Thr Glu Met Glu Lys Glu Gly
130 135 140

Lys Ile Ser Arg Ile Gly Pro Glu Asn Pro Tyr Asn Thr Pro Ile Phe
145 150 155 160
Ala Ile Lys Lys Lys Asp Ser Thr Lys Trp Arg Lys Leu Val Asp Phe
165 170 175
Arg Glu Leu Asn Lys Lys Thr Gln Asp Phe Trp Glu Val Gln Leu Gly
180 185 190
Ile Pro His Pro Ser Gly Leu Lys Lys Lys Lys Ser Val Thr Val Leu
195 200 205

Asp Val Gly Asp Ala Tyr Phe Ser Val Pro Leu Asp Lys Glu Phe Arg
210 215 220
Lys Tyr Thr Ala Phe Thr Ile Pro Ser Thr Asn Asn Glu Thr Pro Gly
225 230 235 240
Ile Arg Tyr Gln Tyr Asn Val Leu Pro Gln Gly Trp Lys Gly Ser Pro
245 250 255
Ala Ile Phe Gln Cys Ser Met Thr Lys Ile Leu Glu Pro Phe Arg Lys
260 265 270

Gln Asn Pro Glu Ile Val Ile Tyr Gln Tyr Met Asp Asp Leu Tyr Val
275 280 285
Gly Ser Asp Leu Glu Ile Glu Gln His Arg Thr Lys Ile Glu Glu Leu
290 295 300
Arg Gln His Leu Leu Lys Trp Gly Phe Thr Thr Pro Asp Lys Lys His
305 310 315 320

Gln Lys Glu Pro Pro Phe Leu Trp Met Gly Tyr Glu Leu His Pro Asp
325 330 335

Lys Trp Thr Val Gln Pro Ile Met Leu Pro Glu Lys Asp Ser Trp Thr
340 345 350

Val Asn Asp Ile Gln Lys Leu Val Gly Lys Leu Asn Trp Ala Ser Gln
355 360 365

Ile Tyr His Gly Gln Val Asp Cys Ser Pro Gly Ile Trp Gln Leu Asp
370 375 380

Cys Thr His Leu Glu Gly Lys Val Ile Leu Val Ala Val His Val Ala
385 390 395 400

Ser Gly Tyr Ile Glu Ala Glu Val Ile Pro Ala Glu Thr Gly Gln Glu
405 410 415

Thr Ala Tyr Phe Ile Leu Lys Leu Ala Gly Arg Trp Pro Val Lys Thr
420 425 430

Val His Thr Asp Asn Gly Ser Asn Phe Thr Ser Ala Thr Val Lys Ala
435 440 445

Ala Cys Trp Trp Ala Gly Val Lys Gln Glu Phe Gly Ile Pro Tyr Asn
450 455 460

Pro Gln Ser Gln Gly Val Val Glu Ser Met Asn Asn Glu Leu Lys Lys
465 470 475 480

Ile Ile Gly Gln Ile Arg Asp Gln Ala Glu His Leu Lys Thr Ala Val
485 490 495

Gln Met Ala Val Phe Ile His Asn Phe Lys Arg Lys Gly Gly Ile Gly
500 505 510

Gly Tyr Ser Ala Gly Glu Arg Ile Ile Asp Ile Ile Ala Thr Asp Ile
515 520 525

Gln Thr Arg Glu Leu Gln Lys Gln Ile Thr Lys Ile Gln Asn Phe Arg
530 535 540

Val Tyr Tyr Arg Asp Asn Arg Asp Pro Leu Trp Lys Gly Pro Ala Lys
545 550 555 560

Leu Leu Trp Lys Gly Glu Gly Ala Val Val Ile Gln Asp Asn Ser Glu

565 570 575

Ile Lys Val Val Pro Arg Arg Lys Val Lys Ile Ile Arg Asp Tyr Gly

580 585 590

Lys Gln Met Ala Gly Asp Asp Cys Val Ala Gly Arg Gln Asp Glu Asp

595 600 605

<210> 742

<211> 498

<212> PRT

<213> Artificial Sequence

<220><223> HIV C gag Epigraph1

<400> 742

Met Gly Ala Arg Ala Ser Ile Leu Arg Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys His Tyr Met Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Met Lys Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Thr Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Glu Lys Ile Glu Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Gln

100 105 110

Gln Lys Thr Gln Gln Ala Lys Ala Ala Asp Gly Lys Val Ser Gln Asn

115 120 125

Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln Ala Ile

130 135 140

Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys Ala

145 150 155 160

Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser Glu Gly Ala
165 170 175
Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His Gln
180 185 190
Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu Ala Ala Glu
195 200 205
Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala Pro Gly Gln
210 215 220

Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu
225 230 235 240
Gln Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Pro Ile Pro Val Gly
245 250 255
Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg
260 265 270
Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly Pro Lys Glu
275 280 285

Pro Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys Thr Leu Arg Ala Glu
290 295 300
Gln Ala Thr Gln Asp Val Lys Asn Trp Met Thr Asp Thr Leu Leu Val
305 310 315 320
Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Arg Ala Leu Gly Pro
325 330 335
Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly
340 345 350

Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Ala Asn
355 360 365
Ser Asn Ile Met Met Gln Arg Ser Asn Phe Lys Gly Pro Lys Arg Ile
370 375 380
Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile Ala Arg Asn Cys
385 390 395 400
Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Lys Glu Gly His

405 410 415

Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile
420 425 430
Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro
435 440 445
Glu Pro Thr Ala Pro Pro Ala Glu Pro Thr Ala Pro Pro Ala Glu Ser
450 455 460
Phe Arg Phe Glu Glu Thr Thr Pro Ala Pro Lys Gln Glu Pro Lys Asp
465 470 475 480

Arg Glu Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Ser Asp Pro Leu
485 490 495
Ser Gln

<210> 743
<211> 231
<212> PRT
<213> Artificial Sequence
<220><223> HIV C gag Epigraph1 Conserved
<400> 743
Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln Ala Ile Ser
1 5 10 15
Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys Ala Phe
20 25 30

Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser Glu Gly Ala Thr
35 40 45
Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His Gln Ala
50 55 60
Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu Ala Ala Glu Trp
65 70 75 80
Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala Pro Gly Gln Met
85 90 95

Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln
100 105 110
Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Pro Ile Pro Val Gly Asp
115 120 125
Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg Met
130 135 140
Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly Pro Lys Glu Pro
145 150 155 160

Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys Thr Leu Arg Ala Glu Gln
165 170 175
Ala Thr Gln Asp Val Lys Asn Trp Met Thr Asp Thr Leu Leu Val Gln
180 185 190
Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Arg Ala Leu Gly Pro Gly
195 200 205
Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro
210 215 220

Gly His Lys Ala Arg Val Leu
225 230

<210> 744
<211> 500
<212> PRT
<213> Artificial Sequence
<220><223> HIV C gag Epigraph2
<400> 744
Met Gly Ala Arg Ala Ser Val Leu Arg Gly Glu Lys Leu Asp Lys Trp
1 5 10 15
Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Met Leu Lys
20 25 30
His Ile Val Trp Ala Ser Arg Glu Leu Glu Lys Phe Ala Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Lys Gln Ile Ile Lys Gln Leu
50 55 60

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His Pro Ala Leu Gln Thr Gly Thr Glu Glu Leu Lys Ser Leu Phe Asn
65                  70                  75                  80
Thr Val Ala Thr Leu Tyr Cys Val His Lys Lys Ile Asp Val Arg Asp
                85                  90                  95
Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Gln
            100                 105                 110

Gln Lys Thr Gln Gln Ala Glu Ala Ala Asp Lys Gly Lys Val Ser Gln
        115                 120                 125
Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln Ala
    130                 135                 140
Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys
145                 150                 155                 160
Ala Phe Ser Pro Glu Ile Ile Pro Met Phe Thr Ala Leu Ser Glu Gly
                165                 170                 175

Ala Thr Pro Thr Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His
            180                 185                 190
Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu Ala Ala
        195                 200                 205
Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Val Ala Pro Gly
    210                 215                 220
Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Asn
225                 230                 235                 240

Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile Pro Val
                245                 250                 255
Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val
            260                 265                 270
Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys
        275                 280                 285
Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys Val Leu Arg Ala
    290                 295                 300

Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu
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305 310 315 320

Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Arg Ala Leu Gly

325 330 335

Pro Gly Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly

340 345 350

Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Ala

355 360 365

Asn Asn Ala Asn Ile Met Met Gln Arg Ser Asn Phe Lys Gly Ser Lys

370 375 380

Arg Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile Ala Lys

385 390 395 400

Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Arg Glu

405 410 415

Gly His Gln Met Lys Asp Cys Asn Glu Arg Gln Ala Asn Phe Leu Gly

420 425 430

Lys Ile Trp Pro Ser Asn Lys Gly Arg Pro Gly Asn Phe Leu Gln Asn

435 440 445

Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu Pro Thr Ala Pro Pro Ala

450 455 460

Glu Ser Phe Lys Phe Glu Glu Thr Thr Pro Ala Pro Lys Gln Glu Ser

465 470 475 480

Lys Asp Arg Glu Pro Leu Ile Ser Leu Lys Ser Leu Phe Gly Asn Asp

485 490 495

Pro Leu Ser Gln

500

<210> 745

<211> 231

<212> PRT

<213> Artificial Sequence

<220><223> HIV C gag Epigraph2 Conserved

<400> 745

Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln Ala Leu Ser

1 5 10 15

Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys Ala Phe

20 25 30

Ser Pro Glu Ile Ile Pro Met Phe Thr Ala Leu Ser Glu Gly Ala Thr

35 40 45

Pro Thr Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His Gln Ala

50 55 60

Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu Ala Ala Glu Trp

65 70 75 80

Asp Arg Val His Pro Val His Ala Gly Pro Val Ala Pro Gly Gln Met

85 90 95

Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Asn Leu Gln

100 105 110

Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile Pro Val Gly Glu

115 120 125

Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg Met

130 135 140

Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro

145 150 155 160

Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys Val Leu Arg Ala Glu Gln

165 170 175

Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln

180 185 190

Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Arg Ala Leu Gly Pro Gly

195 200 205

Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro

210 215 220

Ser His Lys Ala Arg Val Leu

225 230

<210> 746

<211> 207

<212> PRT

<213> Artificial Sequence

<220><223> HIV C nef Epigraph1

<400> 746

Met Gly Gly Lys Trp Ser Lys Ser Ser Ile Val Gly Trp Pro Ala Val
1 5 10 15

Arg Glu Arg Ile Arg Arg Thr Glu Pro Ala Ala Glu Gly Val Gly Ala
20 25 30

Ala Ser Gln Asp Leu Asp Lys Tyr Gly Ala Leu Thr Ser Ser Asn Thr
35 40 45

Ala His Asn Asn Ala Asp Cys Ala Trp Leu Gln Ala Gln Glu Glu Glu
50 55 60

Glu Glu Val Gly Phe Pro Val Arg Pro Gln Val Pro Leu Arg Pro Met
65 70 75 80

Thr Tyr Lys Ala Ala Phe Asp Leu Ser Phe Phe Leu Lys Glu Lys Gly
85 90 95

Gly Leu Glu Gly Leu Ile Tyr Ser Lys Lys Arg Gln Glu Ile Leu Asp
100 105 110

Leu Trp Val Tyr His Thr Gln Gly Phe Phe Pro Asp Trp Gln Asn Tyr
115 120 125

Thr Pro Gly Pro Gly Val Arg Tyr Pro Leu Thr Phe Gly Trp Cys Phe
130 135 140

Lys Leu Val Pro Val Asp Pro Arg Glu Val Glu Glu Ala Asn Glu Gly
145 150 155 160

Glu Asn Asn Cys Leu Leu His Pro Met Ser Gln His Gly Met Glu Asp
165 170 175

Glu Asp Arg Glu Val Leu Lys Trp Gln Phe Asp Ser Ser Leu Ala Arg
180 185 190

Arg His Met Ala Arg Glu Leu His Pro Glu Tyr Tyr Lys Asp Cys
195 200 205

<210> 747

<211> 80

<212> PRT

<213> Artificial Sequence

<220><223> HIV C nef Epigraph1 Conserved

<400> 747

Gly Phe Pro Val Arg Pro Gln Val Pro Leu Arg Pro Met Thr Tyr Lys
1 5 10 15

Ala Ala Phe Asp Leu Ser Phe Phe Leu Lys Glu Lys Gly Gly Leu Glu
20 25 30

Gly Leu Ile Tyr Ser Lys Lys Arg Gln Glu Ile Leu Asp Leu Trp Val
35 40 45

Tyr His Thr Gln Gly Phe Phe Pro Asp Trp Gln Asn Tyr Thr Pro Gly
50 55 60

Pro Gly Val Arg Tyr Pro Leu Thr Phe Gly Trp Cys Phe Lys Leu Val
65 70 75 80

<210> 748

<211> 207

<212> PRT

<213> Artificial Sequence

<220><223> HIV C nef Epigraph2

<400> 748

Met Gly Ser Lys Trp Ser Lys Ser Ser Ile Val Gly Trp Pro Ala Val
1 5 10 15

Arg Glu Arg Met Arg Arg Ala Glu Pro Ala Ala Glu Gly Val Gly Ala
20 25 30

Ala Ser Arg Asp Leu Asp Lys His Gly Ala Leu Thr Ser Ser Asn Thr
35 40 45

Pro Ala Asn Asn Ala Asp Cys Ala Trp Leu Glu Ala Gln Glu Glu Glu
50 55 60

Gly Glu Val Gly Phe Pro Val Lys Pro Gln Val Pro Leu Arg Pro Met
65 70 75 80

Thr Tyr Lys Gly Ala Phe Asp Leu Gly Phe Phe Leu Lys Glu Lys Gly
85 90 95

Gly Leu Asp Gly Leu Ile Tyr Ser Lys Lys Arg Gln Asp Ile Leu Asp
100 105 110
Leu Trp Val Tyr Asn Thr Gln Gly Tyr Phe Pro Asp Trp Gln Asn Tyr
115 120 125

Thr Pro Gly Pro Gly Ile Arg Tyr Pro Leu Thr Phe Gly Trp Cys Tyr
130 135 140
Lys Leu Val Pro Val Asp Pro Ser Glu Val Glu Glu Ala Asn Lys Gly
145 150 155 160
Glu Asn Asn Cys Leu Leu His Pro Met Ser Leu His Gly Met Glu Asp
165 170 175
Glu His Arg Glu Val Leu Lys Trp Lys Phe Asp Ser Ser Leu Ala Arg
180 185 190

Arg His Leu Ala Arg Glu Lys His Pro Glu Phe Tyr Lys Asp Cys
195 200 205

<210> 749
<211> 80
<212> PRT
<213> Artificial Sequence
<220><223> HIV C nef Epigraph2 Conserved
<400> 749
Gly Phe Pro Val Lys Pro Gln Val Pro Leu Arg Pro Met Thr Tyr Lys
1 5 10 15
Gly Ala Phe Asp Leu Gly Phe Phe Leu Lys Glu Lys Gly Gly Leu Asp
20 25 30

Gly Leu Ile Tyr Ser Lys Lys Arg Gln Asp Ile Leu Asp Leu Trp Val
35 40 45
Tyr Asn Thr Gln Gly Tyr Phe Pro Asp Trp Gln Asn Tyr Thr Pro Gly
50 55 60
Pro Gly Ile Arg Tyr Pro Leu Thr Phe Gly Trp Cys Tyr Lys Leu Val
65 70 75 80
<210> 750
<211> 1007

<212> PRT

<213> Artificial Sequence

<220><223> HIV C pol Epigraph1

<400> 750

Phe Phe Arg Glu Asn Leu Ala Phe Pro Gln Gly Glu Ala Arg Glu Phe
1 5 10 15
Pro Ser Glu Gln Thr Arg Ala Asn Ser Pro Thr Ser Arg Ala Asn Ser
20 25 30
Pro Thr Ser Arg Glu Leu Gln Val Arg Gly Asp Asn Pro Arg Ser Glu
35 40 45
Ala Gly Ala Glu Arg Gln Gly Thr Leu Asn Phe Pro Gln Ile Thr Leu
50 55 60

Trp Gln Arg Pro Leu Val Ser Ile Lys Val Gly Gly Gln Ile Lys Glu
65 70 75 80
Ala Leu Leu Asp Thr Gly Ala Asp Asp Thr Val Leu Glu Glu Ile Asn
85 90 95
Leu Pro Gly Lys Trp Lys Pro Lys Met Ile Gly Gly Ile Gly Gly Phe
100 105 110
Ile Lys Val Arg Gln Tyr Asp Gln Ile Leu Ile Glu Ile Cys Gly Lys
115 120 125

Lys Ala Ile Gly Thr Val Leu Val Gly Pro Thr Pro Val Asn Ile Ile
130 135 140
Gly Arg Asn Met Leu Thr Gln Leu Gly Cys Thr Leu Asn Phe Pro Ile
145 150 155 160
Ser Pro Ile Glu Thr Val Pro Val Lys Leu Lys Pro Gly Met Asp Gly
165 170 175
Pro Lys Val Lys Gln Trp Pro Leu Thr Glu Glu Lys Ile Lys Ala Leu
180 185 190

Thr Ala Ile Cys Glu Glu Met Glu Lys Glu Gly Lys Ile Thr Lys Ile
195 200 205
Gly Pro Glu Asn Pro Tyr Asn Thr Pro Val Phe Ala Ile Lys Lys Lys

210 215 220

Asp Ser Thr Lys Trp Arg Lys Leu Val Asp Phe Arg Glu Leu Asn Lys
225 230 235 240

Arg Thr Gln Asp Phe Trp Glu Val Gln Leu Gly Ile Pro His Pro Ala
245 250 255

Gly Leu Lys Lys Lys Lys Ser Val Thr Val Leu Asp Val Gly Asp Ala
260 265 270

Tyr Phe Ser Val Pro Leu Asp Glu Gly Phe Arg Lys Tyr Thr Ala Phe
275 280 285

Thr Ile Pro Ser Ile Asn Asn Glu Thr Pro Gly Ile Arg Tyr Gln Tyr
290 295 300

Asn Val Leu Pro Gln Gly Trp Lys Gly Ser Pro Ala Ile Phe Gln Ser
305 310 315 320

Ser Met Thr Lys Ile Leu Glu Pro Phe Arg Ala Gln Asn Pro Glu Ile
325 330 335

Val Ile Tyr Gln Tyr Met Asp Asp Leu Tyr Val Gly Ser Asp Leu Glu
340 345 350

Ile Gly Gln His Arg Ala Lys Ile Glu Glu Leu Arg Glu His Leu Leu
355 360 365

Lys Trp Gly Phe Thr Thr Pro Asp Lys Lys His Gln Lys Glu Pro Pro
370 375 380

Phe Leu Trp Met Gly Tyr Glu Leu His Pro Asp Lys Trp Thr Val Gln
385 390 395 400

Pro Ile Gln Leu Pro Glu Lys Asp Ser Trp Thr Val Asn Asp Ile Gln
405 410 415

Lys Leu Val Gly Lys Leu Asn Trp Ala Ser Gln Ile Tyr Pro Gly Ile
420 425 430

Lys Val Arg Gln Leu Cys Lys Leu Leu Arg Gly Ala Lys Ala Leu Thr
435 440 445

Asp Ile Val Pro Leu Thr Glu Glu Ala Glu Leu Glu Leu Ala Glu Asn
450 455 460

Arg Glu Ile Leu Lys Glu Pro Val His Gly Val Tyr Tyr Asp Pro Ser
465 470 475 480
Lys Asp Leu Ile Ala Glu Ile Gln Lys Gln Gly His Asp Gln Trp Thr
485 490 495
Tyr Gln Ile Tyr Gln Glu Pro Phe Lys Asn Leu Lys Thr Gly Lys Tyr
500 505 510

Ala Lys Met Arg Thr Ala His Thr Asn Asp Val Lys Gln Leu Thr Glu
515 520 525
Ala Val Gln Lys Ile Ala Met Glu Ser Ile Val Ile Trp Gly Lys Thr
530 535 540
Pro Lys Phe Arg Leu Pro Ile Gln Lys Glu Thr Trp Glu Thr Trp Trp
545 550 555 560
Thr Asp Tyr Trp Gln Ala Thr Trp Ile Pro Glu Trp Glu Phe Val Asn
565 570 575

Thr Pro Pro Leu Val Lys Leu Trp Tyr Gln Leu Glu Lys Glu Pro Ile
580 585 590
Ala Gly Ala Glu Thr Phe Tyr Val Asp Gly Ala Ala Asn Arg Glu Thr
595 600 605
Lys Ile Gly Lys Ala Gly Tyr Val Thr Asp Arg Gly Arg Gln Lys Ile
610 615 620
Val Ser Leu Thr Glu Thr Thr Asn Gln Lys Thr Glu Leu Gln Ala Ile
625 630 635 640

Gln Leu Ala Leu Gln Asp Ser Gly Ser Glu Val Asn Ile Val Thr Asp
645 650 655
Ser Gln Tyr Ala Leu Gly Ile Ile Gln Ala Gln Pro Asp Lys Ser Glu
660 665 670
Ser Glu Leu Val Asn Gln Ile Ile Glu Gln Leu Ile Lys Lys Glu Arg
675 680 685
Val Tyr Leu Ser Trp Val Pro Ala His Lys Gly Ile Gly Gly Asn Glu
690 695 700

Gln Val Asp Lys Leu Val Ser Ser Gly Ile Arg Lys Val Leu Phe Leu

705 710 715 720

Asp Gly Ile Asp Lys Ala Gln Glu Glu His Glu Lys Tyr His Ser Asn

725 730 735

Trp Arg Ala Met Ala Ser Glu Phe Asn Leu Pro Pro Ile Val Ala Lys

740 745 750

Glu Ile Val Ala Ser Cys Asp Lys Cys Gln Leu Lys Gly Glu Ala Ile

755 760 765

His Gly Gln Val Asp Cys Ser Pro Gly Ile Trp Gln Leu Asp Cys Thr

770 775 780

His Leu Glu Gly Lys Ile Ile Leu Val Ala Val His Val Ala Ser Gly

785 790 795 800

Tyr Ile Glu Ala Glu Val Ile Pro Ala Glu Thr Gly Gln Glu Thr Ala

805 810 815

Tyr Tyr Ile Leu Lys Leu Ala Gly Arg Trp Pro Val Lys Val Ile His

820 825 830

Thr Asp Asn Gly Ser Asn Phe Thr Ser Ala Ala Val Lys Ala Ala Cys

835 840 845

Trp Trp Ala Gly Ile Gln Gln Glu Phe Gly Ile Pro Tyr Asn Pro Gln

850 855 860

Ser Gln Gly Val Val Glu Ser Met Asn Lys Glu Leu Lys Lys Ile Ile

865 870 875 880

Gly Gln Val Arg Asp Gln Ala Glu His Leu Lys Thr Ala Val Gln Met

885 890 895

Ala Val Phe Ile His Asn Phe Lys Arg Lys Gly Gly Ile Gly Gly Tyr

900 905 910

Ser Ala Gly Glu Arg Ile Ile Asp Ile Ile Ala Thr Asp Ile Gln Thr

915 920 925

Lys Glu Leu Gln Lys Gln Ile Ile Lys Ile Gln Asn Phe Arg Val Tyr

930 935 940

Tyr Arg Asp Ser Arg Asp Pro Ile Trp Lys Gly Pro Ala Lys Leu Leu

945 950 955 960

Trp Lys Gly Glu Gly Ala Val Val Ile Gln Asp Asn Ser Asp Ile Lys
965 970 975
Val Val Pro Arg Arg Lys Val Lys Ile Ile Lys Asp Tyr Gly Lys Gln
980 985 990
Met Ala Gly Ala Asp Cys Val Ala Gly Arg Gln Asp Glu Asp Gln
995 1000 1005

<210> 751
<211> 609
<212> PRT
<213> Artificial Sequence
<220><223> HIV C pol Epigraph1 Conserved
<400> 751

Pro Gln Ile Thr Leu Trp Gln Arg Pro Leu Val Ser Ile Lys Val Gly
1 5 10 15
Gly Gln Ile Lys Glu Ala Leu Leu Asp Thr Gly Ala Asp Asp Thr Val
20 25 30
Leu Glu Glu Ile Asn Leu Pro Gly Lys Trp Lys Pro Lys Met Ile Gly
35 40 45
Gly Ile Gly Gly Phe Ile Lys Val Arg Gln Tyr Asp Gln Ile Leu Ile
50 55 60

Glu Ile Cys Gly Lys Lys Ala Ile Gly Thr Val Leu Val Gly Pro Thr
65 70 75 80
Pro Val Asn Ile Ile Gly Arg Asn Met Leu Thr Gln Leu Gly Cys Thr
85 90 95
Leu Asn Phe Pro Ile Ser Pro Ile Glu Thr Val Pro Val Lys Leu Lys
100 105 110
Pro Gly Met Asp Gly Pro Lys Val Lys Gln Trp Pro Leu Thr Glu Glu
115 120 125

Lys Ile Lys Ala Leu Thr Ala Ile Cys Glu Glu Met Glu Lys Glu Gly
130 135 140
Lys Ile Thr Lys Ile Gly Pro Glu Asn Pro Tyr Asn Thr Pro Val Phe
145 150 155 160

Ala Ile Lys Lys Lys Asp Ser Thr Lys Trp Arg Lys Leu Val Asp Phe
165 170 175
Arg Glu Leu Asn Lys Arg Thr Gln Asp Phe Trp Glu Val Gln Leu Gly
180 185 190

Ile Pro His Pro Ala Gly Leu Lys Lys Lys Lys Ser Val Thr Val Leu
195 200 205
Asp Val Gly Asp Ala Tyr Phe Ser Val Pro Leu Asp Glu Gly Phe Arg
210 215 220
Lys Tyr Thr Ala Phe Thr Ile Pro Ser Ile Asn Asn Glu Thr Pro Gly
225 230 235 240
Ile Arg Tyr Gln Tyr Asn Val Leu Pro Gln Gly Trp Lys Gly Ser Pro
245 250 255

Ala Ile Phe Gln Ser Ser Met Thr Lys Ile Leu Glu Pro Phe Arg Ala
260 265 270
Gln Asn Pro Glu Ile Val Ile Tyr Gln Tyr Met Asp Asp Leu Tyr Val
275 280 285
Gly Ser Asp Leu Glu Ile Gly Gln His Arg Ala Lys Ile Glu Glu Leu
290 295 300
Arg Glu His Leu Leu Lys Trp Gly Phe Thr Thr Pro Asp Lys Lys His
305 310 315 320

Gln Lys Glu Pro Pro Phe Leu Trp Met Gly Tyr Glu Leu His Pro Asp
325 330 335
Lys Trp Thr Val Gln Pro Ile Gln Leu Pro Glu Lys Asp Ser Trp Thr
340 345 350
Val Asn Asp Ile Gln Lys Leu Val Gly Lys Leu Asn Trp Ala Ser Gln
355 360 365
Ile Tyr His Gly Gln Val Asp Cys Ser Pro Gly Ile Trp Gln Leu Asp
370 375 380

Cys Thr His Leu Glu Gly Lys Ile Ile Leu Val Ala Val His Val Ala
385 390 395 400
Ser Gly Tyr Ile Glu Ala Glu Val Ile Pro Ala Glu Thr Gly Gln Glu

405 410 415

Thr Ala Tyr Tyr Ile Leu Lys Leu Ala Gly Arg Trp Pro Val Lys Val

420 425 430

Ile His Thr Asp Asn Gly Ser Asn Phe Thr Ser Ala Ala Val Lys Ala

435 440 445

Ala Cys Trp Trp Ala Gly Ile Gln Gln Glu Phe Gly Ile Pro Tyr Asn

450 455 460

Pro Gln Ser Gln Gly Val Val Glu Ser Met Asn Lys Glu Leu Lys Lys

465 470 475 480

Ile Ile Gly Gln Val Arg Asp Gln Ala Glu His Leu Lys Thr Ala Val

485 490 495

Gln Met Ala Val Phe Ile His Asn Phe Lys Arg Lys Gly Gly Ile Gly

500 505 510

Gly Tyr Ser Ala Gly Glu Arg Ile Ile Asp Ile Ile Ala Thr Asp Ile

515 520 525

Gln Thr Lys Glu Leu Gln Lys Gln Ile Ile Lys Ile Gln Asn Phe Arg

530 535 540

Val Tyr Tyr Arg Asp Ser Arg Asp Pro Ile Trp Lys Gly Pro Ala Lys

545 550 555 560

Leu Leu Trp Lys Gly Glu Gly Ala Val Val Ile Gln Asp Asn Ser Asp

565 570 575

Ile Lys Val Val Pro Arg Arg Lys Val Lys Ile Ile Lys Asp Tyr Gly

580 585 590

Lys Gln Met Ala Gly Ala Asp Cys Val Ala Gly Arg Gln Asp Glu Asp

595 600 605

Gln

<210> 752

<211> 1006

<212> PRT

<213> Artificial Sequence

<220><223> HIV C pol Epigraph2

<400> 752

Phe Phe Arg Glu Asn Leu Ala Phe Gln Gln Gly Glu Ala Arg Glu Phe
1 5 10 15

Pro Ser Glu Gln Ala Arg Ala Asn Ser Pro Thr Ser Arg Ala Asn Ser
20 25 30

Pro Thr Ser Arg Glu Leu Gln Val Arg Gly Asp Asn Pro Cys Ser Glu
35 40 45

Ala Gly Ala Glu Arg Gln Gly Thr Phe Asn Phe Pro Gln Ile Thr Leu
50 55 60

Trp Gln Arg Pro Leu Val Thr Ile Lys Val Gly Gly Gln Ile Lys Glu
65 70 75 80

Ala Leu Leu Asp Thr Gly Ala Asp Asp Thr Val Leu Glu Asp Ile Asn
85 90 95

Leu Pro Gly Lys Trp Lys Pro Arg Met Ile Gly Gly Ile Gly Gly Phe
100 105 110

Ile Lys Val Arg Gln Tyr Asp Gln Ile Pro Ile Glu Ile Cys Gly Lys
115 120 125

Lys Ala Ile Gly Ser Val Leu Val Gly Pro Thr Pro Val Asn Ile Ile
130 135 140

Gly Arg Asn Leu Leu Thr Gln Leu Gly Cys Thr Leu Asn Phe Pro Ile
145 150 155 160

Ser Pro Ile Glu Thr Ile Pro Val Lys Leu Lys Pro Gly Met Asp Gly
165 170 175

Pro Arg Val Lys Gln Trp Pro Leu Thr Glu Glu Lys Ile Lys Ala Leu
180 185 190

Thr Glu Ile Cys Glu Glu Met Glu Lys Glu Gly Lys Ile Ser Lys Ile
195 200 205

Gly Pro Glu Asn Pro Tyr Asn Thr Pro Ile Phe Ala Ile Lys Lys Lys
210 215 220

Asp Ser Thr Lys Trp Arg Lys Leu Val Asp Phe Arg Glu Leu Asn Lys
225 230 235 240

Arg Thr Gln Asp Phe Trp Glu Val Gln Leu Gly Ile Pro His Pro Ala
245 250 255
Gly Leu Lys Lys Lys Lys Ser Val Thr Val Leu Asp Val Gly Asp Ala
260 265 270

Tyr Phe Ser Val Pro Leu Asp Glu Ser Phe Arg Lys Tyr Thr Ala Phe
275 280 285
Thr Ile Pro Ser Thr Asn Asn Glu Thr Pro Gly Ile Arg Tyr Gln Tyr
290 295 300
Asn Val Leu Pro Gln Gly Trp Lys Gly Ser Pro Ala Ile Phe Gln Ser
305 310 315 320
Ser Met Thr Arg Ile Leu Glu Pro Phe Arg Ala Lys Asn Pro Glu Ile
325 330 335

Val Ile Tyr Gln Tyr Met Asp Asp Leu Tyr Val Gly Ser Asp Leu Glu
340 345 350
Ile Glu Gln His Arg Ala Lys Ile Glu Glu Leu Arg Glu His Leu Leu
355 360 365
Arg Trp Gly Phe Thr Thr Pro Asp Lys Lys His Gln Lys Glu Pro Pro
370 375 380
Phe Leu Trp Met Gly Tyr Glu Leu His Pro Asp Lys Trp Thr Val Gln
385 390 395 400

Pro Ile Gln Leu Pro Glu Lys Glu Ser Trp Thr Val Asn Asp Ile Gln
405 410 415
Lys Leu Val Gly Lys Leu Asn Trp Ala Ser Gln Ile Tyr Pro Gly Ile
420 425 430
Lys Val Lys Gln Leu Cys Lys Leu Leu Arg Gly Thr Lys Ala Leu Thr
435 440 445
Asp Ile Val Pro Leu Thr Glu Glu Ala Glu Leu Glu Leu Ala Glu Asn
450 455 460

Arg Glu Ile Leu Arg Glu Pro Val His Gly Val Tyr Tyr Asp Pro Ser
465 470 475 480
Lys Glu Leu Ile Ala Glu Ile Gln Lys Gln Gly Gln Asp Gln Trp Thr

485 490 495

Tyr Gln Ile Tyr Gln Glu Pro Phe Lys Asn Leu Lys Thr Gly Lys Tyr

500 505 510

Ala Lys Arg Arg Thr Ala His Thr Asn Asp Val Arg Gln Leu Thr Glu

515 520 525

Ala Val Gln Lys Ile Ala Leu Glu Ser Ile Val Ile Trp Gly Lys Ile

530 535 540

Pro Lys Phe Arg Leu Pro Ile Gln Lys Glu Thr Trp Glu Ile Trp Trp

545 550 555 560

Thr Asp Tyr Trp Gln Ala Thr Trp Ile Pro Asp Trp Glu Phe Val Asn

565 570 575

Thr Pro Pro Leu Val Lys Leu Trp Tyr Gln Leu Glu Lys Glu Pro Ile

580 585 590

Ala Gly Val Glu Thr Phe Tyr Val Asp Gly Ala Ala Asn Arg Glu Thr

595 600 605

Lys Leu Gly Lys Ala Gly Tyr Val Thr Asp Lys Gly Arg Gln Lys Ile

610 615 620

Val Thr Leu Thr Glu Thr Thr Asn Gln Lys Ala Glu Leu Gln Ala Ile

625 630 635 640

Gln Leu Ala Leu Gln Asp Ser Gly Pro Glu Val Asn Ile Val Thr Asp

645 650 655

Ser Gln Tyr Ala Leu Gly Ile Ile Gln Ala Gln Pro Asp Lys Ser Glu

660 665 670

Ser Glu Ile Val Asn Gln Ile Ile Glu Gln Leu Ile Asn Lys Glu Arg

675 680 685

Ile Tyr Leu Ser Trp Val Pro Ala His Lys Gly Ile Gly Gly Asn Glu

690 695 700

Gln Val Asp Lys Leu Val Ser Asn Gly Ile Arg Lys Val Leu Phe Leu

705 710 715 720

Asp Gly Ile Asp Lys Ala Gln Glu Glu His Glu Lys Tyr His Asn Asn

725 730 735

Trp Arg Ala Met Ala Ser Asp Phe Asn Leu Pro Pro Val Val Ala Lys
740 745 750

Glu Ile Val Ala Ser Cys Asp Gln Cys Gln Leu Lys Gly Glu Ala Met
755 760 765

His Gly Gln Val Asp Cys Ser Pro Gly Ile Trp Gln Leu Asp Cys Thr
770 775 780

His Leu Glu Gly Lys Val Ile Leu Val Ala Val His Val Ala Ser Gly
785 790 795 800

Tyr Met Glu Ala Glu Val Ile Pro Ala Glu Thr Gly Gln Glu Thr Ala
805 810 815

Tyr Phe Ile Leu Lys Leu Ala Gly Arg Trp Pro Val Lys Ile Ile His
820 825 830

Thr Asp Asn Gly Ser Asn Phe Thr Ser Thr Ala Val Lys Ala Ala Cys
835 840 845

Trp Trp Ala Gly Ile Lys Gln Glu Phe Gly Ile Pro Tyr Asn Pro Gln
850 855 860

Ser Gln Gly Val Val Glu Ser Met Asn Lys Glu Leu Lys Lys Ile Ile
865 870 875 880

Gly Gln Val Arg Glu Gln Ala Glu His Leu Lys Thr Ala Val Gln Met
885 890 895

Ala Val Phe Ile His Asn Phe Lys Arg Arg Gly Gly Ile Gly Gly Tyr
900 905 910

Ser Ala Gly Glu Arg Ile Ile Asp Ile Ile Ala Ser Asp Ile Gln Thr
915 920 925

Lys Glu Leu Gln Lys Gln Ile Thr Lys Ile Gln Asn Phe Arg Val Tyr
930 935 940

Tyr Arg Asp Ser Arg Asp Pro Ile Trp Lys Gly Pro Ala Lys Leu Leu
945 950 955 960

Trp Lys Gly Glu Gly Ala Val Val Leu Gln Asp Asn Ser Asp Ile Lys
965 970 975

Val Val Pro Arg Arg Lys Ala Lys Ile Ile Arg Asp Tyr Gly Lys Gln

980 985 990

Met Ala Gly Asp Asp Cys Val Ala Gly Arg Gln Asp Glu Asp

995 1000 1005

<210> 753

<211> 607

<212> PRT

<213> Artificial Sequence

<220><223> HIV C pol Epigraph2 Conserved

<400> 753

Pro Gln Ile Thr Leu Trp Gln Arg Pro Leu Val Thr Ile Lys Val Gly

1 5 10 15

Gly Gln Ile Lys Glu Ala Leu Leu Asp Thr Gly Ala Asp Asp Thr Val

20 25 30

Leu Glu Asp Ile Asn Leu Pro Gly Lys Trp Lys Pro Arg Met Ile Gly

35 40 45

Gly Ile Gly Gly Phe Ile Lys Val Arg Gln Tyr Asp Gln Ile Pro Ile

50 55 60

Glu Ile Cys Gly Lys Lys Ala Ile Gly Ser Val Leu Val Gly Pro Thr

65 70 75 80

Pro Val Asn Ile Ile Gly Arg Asn Leu Leu Thr Gln Leu Gly Cys Thr

85 90 95

Leu Asn Phe Pro Ile Ser Pro Ile Glu Thr Ile Pro Val Lys Leu Lys

100 105 110

Pro Gly Met Asp Gly Pro Arg Val Lys Gln Trp Pro Leu Thr Glu Glu

115 120 125

Lys Ile Lys Ala Leu Thr Glu Ile Cys Glu Glu Met Glu Lys Glu Gly

130 135 140

Lys Ile Ser Lys Ile Gly Pro Glu Asn Pro Tyr Asn Thr Pro Ile Phe

145 150 155 160

Ala Ile Lys Lys Lys Asp Ser Thr Lys Trp Arg Lys Leu Val Asp Phe

165 170 175

Arg Glu Leu Asn Lys Arg Thr Gln Asp Phe Trp Glu Val Gln Leu Gly

180 185 190

Ile Pro His Pro Ala Gly Leu Lys Lys Lys Lys Ser Val Thr Val Leu

195 200 205

Asp Val Gly Asp Ala Tyr Phe Ser Val Pro Leu Asp Glu Ser Phe Arg

210 215 220

Lys Tyr Thr Ala Phe Thr Ile Pro Ser Thr Asn Asn Glu Thr Pro Gly

225 230 235 240

Ile Arg Tyr Gln Tyr Asn Val Leu Pro Gln Gly Trp Lys Gly Ser Pro

245 250 255

Ala Ile Phe Gln Ser Ser Met Thr Arg Ile Leu Glu Pro Phe Arg Ala

260 265 270

Lys Asn Pro Glu Ile Val Ile Tyr Gln Tyr Met Asp Asp Leu Tyr Val

275 280 285

Gly Ser Asp Leu Glu Ile Glu Gln His Arg Ala Lys Ile Glu Glu Leu

290 295 300

Arg Glu His Leu Leu Arg Trp Gly Phe Thr Thr Pro Asp Lys Lys His

305 310 315 320

Gln Lys Glu Pro Pro Phe Leu Trp Met Gly Tyr Glu Leu His Pro Asp

325 330 335

Lys Trp Thr Val Gln Pro Ile Gln Leu Pro Glu Lys Glu Ser Trp Thr

340 345 350

Val Asn Asp Ile Gln Lys Leu Val Gly Lys Leu Asn Trp Ala Ser Gln

355 360 365

Ile Tyr His Gly Gln Val Asp Cys Ser Pro Gly Ile Trp Gln Leu Asp

370 375 380

Cys Thr His Leu Glu Gly Lys Val Ile Leu Val Ala Val His Val Ala

385 390 395 400

Ser Gly Tyr Met Glu Ala Glu Val Ile Pro Ala Glu Thr Gly Gln Glu

405 410 415

Thr Ala Tyr Phe Ile Leu Lys Leu Ala Gly Arg Trp Pro Val Lys Ile

420 425 430

Ile His Thr Asp Asn Gly Ser Asn Phe Thr Ser Thr Ala Val Lys Ala
435 440 445
Ala Cys Trp Trp Ala Gly Ile Lys Gln Glu Phe Gly Ile Pro Tyr Asn
450 455 460
Pro Gln Ser Gln Gly Val Val Glu Ser Met Asn Lys Glu Leu Lys Lys

465 470 475 480
Ile Ile Gly Gln Val Arg Glu Gln Ala Glu His Leu Lys Thr Ala Val
485 490 495
Gln Met Ala Val Phe Ile His Asn Phe Lys Arg Arg Gly Gly Ile Gly
500 505 510
Gly Tyr Ser Ala Gly Glu Arg Ile Ile Asp Ile Ile Ala Ser Asp Ile
515 520 525
Gln Thr Lys Glu Leu Gln Lys Gln Ile Thr Lys Ile Gln Asn Phe Arg

530 535 540
Val Tyr Tyr Arg Asp Ser Arg Asp Pro Ile Trp Lys Gly Pro Ala Lys
545 550 555 560
Leu Leu Trp Lys Gly Glu Gly Ala Val Val Leu Gln Asp Asn Ser Asp
565 570 575
Ile Lys Val Val Pro Arg Arg Lys Ala Lys Ile Ile Arg Asp Tyr Gly
580 585 590
Lys Gln Met Ala Gly Asp Asp Cys Val Ala Gly Arg Gln Asp Glu

595 600 605
<210> 754
<211> 520
<212> PRT
<213> Artificial Sequence
<220><223> HIV M Gag episensus EG-0, Tailored
<400> 754
Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Ala Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His

130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Lys

370 375 380

Gly Gln Lys Arg Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile

385 390 395 400

Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly

405 410 415

Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe

420 425 430

Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Ser Arg Pro Glu Pro Thr Ala Gln Ser Arg Pro Glu Pro Thr Ala

450 455 460

Pro Pro Ala Glu Ser Phe Arg Pro Gln Pro Thr Ala Pro Pro Glu Glu

465 470 475 480

Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln Lys Gln Glu

485 490 495

Pro Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys Ser Leu Phe

500 505 510

Gly Asn Asp Pro Leu Ser Gln Tyr

515 520

<210> 755

<211> 231

<212> PRT

<213> Artificial Sequence

<220><223> HIV M gag episensus EG-0 Conserved, Tailored

<400> 755

Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln Ala Ile Ser
1 5 10 15

Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys Ala Phe
20 25 30

Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu Gly Ala Thr
35 40 45

Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His Gln Ala
50 55 60

Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp
65 70 75 80

Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala Pro Gly Gln Met
85 90 95

Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln
100 105 110

Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro Val Gly Glu
115 120 125

Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg Met
130 135 140

Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro
145 150 155 160

Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln
165 170 175

Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln
180 185 190

Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro Ala

195 200 205

Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro

210 215 220

Gly His Lys Ala Arg Val Leu

225 230

<210> 756

<211> 532

<212> PRT

<213> Artificial Sequence

<220><223> HIV M gag CEN-1, Tailored

<400> 756

Met Gly Ala Arg Ala Ser Val Leu Thr Gly Gly Lys Leu Asp Ala Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Met Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Ile Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Gln Gln Ile Ile Glu Gln Leu

50 55 60

Gln Ser Thr Leu Lys Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Trp Cys Val His Gln Arg Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Leu Glu Glu Val Gln Asn Lys Ser Gln

100 105 110

Gln Lys Thr Gln Gln Ala Ala Ala Gly Thr Gly Ser Ser Ser Lys Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ala Gln Gly Gln Met Val His

130 135 140

Gln Pro Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu

145 150 155 160

Glu Lys Gly Phe Asn Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175
Asp Gly Ala Thr Pro Gln Asp Leu Asn Met Met Leu Asn Ile Val Gly
180 185 190
Gly His Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu
195 200 205
Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Pro

210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Glu Ser Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile
245 250 255
Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu His Lys
260 265 270
Ile Val Arg Met Tyr Ser Pro Val Gly Ile Leu Asp Ile Lys Gln Gly

275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Ile Gln Asn Ala Asn Pro Asp Cys Lys Ser Ile Leu Lys Ala
325 330 335
Leu Gly Thr Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350
Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Ala Gln His Ala Asn Ile Met Met Gln Arg Gly Asn Phe Lys Gly
370 375 380
Gln Arg Lys Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His Leu Ala
385 390 395 400
Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys Gly Gln

405 410 415

Glu Gly His Gln Met Lys Asp Cys Asn Glu Arg Gln Ala Asn Phe Leu

420 425 430

Gly Lys Ile Trp Pro Ser Asn Lys Gly Arg Pro Gly Asn Phe Pro Gln

435 440 445

Ser Arg Pro Glu Pro Thr Ala Pro Arg Thr Glu Pro Thr Ala Pro Pro

450 455 460

Ala Arg Pro Glu Pro Thr Ala Pro Pro Leu Gln Ser Arg Leu Glu Pro

465 470 475 480

Thr Ala Pro Pro Ala Glu Pro Thr Ala Pro Pro Ala Glu Asn Trp Gly

485 490 495

Met Gly Glu Glu Ile Thr Ser Leu Leu Lys Gln Glu Gln Lys Asp Lys

500 505 510

Glu His Pro Pro Pro Leu Val Ser Leu Lys Ser Leu Phe Gly Asn Asp

515 520 525

Pro Leu Leu Gln

530

<210> 757

<211> 231

<212> PRT

<213> Artificial Sequence

<220><223> HIV M gag CEN-1 Conserved, Tailored

<400> 757

Pro Ile Val Gln Asn Ala Gln Gly Gln Met Val His Gln Pro Leu Ser

1 5 10 15

Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys Gly Phe

20 25 30

Asn Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Asp Gly Ala Thr

35 40 45

Pro Gln Asp Leu Asn Met Met Leu Asn Ile Val Gly Gly His Gln Ala

50 55 60

Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu Ala Ala Glu Trp

65 70 75 80

Asp Arg Val His Pro Val His Ala Gly Pro Ile Pro Pro Gly Gln Met

85 90 95

Arg Glu Pro Arg Glu Ser Asp Ile Ala Gly Thr Thr Ser Asn Leu Gln

100 105 110

Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile Pro Val Gly Asp

115 120 125

Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu His Lys Ile Val Arg Met

130 135 140

Tyr Ser Pro Val Gly Ile Leu Asp Ile Lys Gln Gly Pro Lys Glu Pro

145 150 155 160

Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys Thr Leu Arg Ala Glu Gln

165 170 175

Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu Ile Gln

180 185 190

Asn Ala Asn Pro Asp Cys Lys Ser Ile Leu Lys Ala Leu Gly Thr Gly

195 200 205

Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro

210 215 220

Ser His Lys Ala Arg Val Leu

225 230

<210> 758

<211> 536

<212> PRT

<213> Artificial Sequence

<220><223> HIV M gag CEN-2, Tailored

<400> 758

Met Gly Ala Arg Ala Ser Ile Leu Arg Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys His Tyr Met Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Lys Phe Ala Leu Asn Pro

35 40 45

Asp Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Ile Lys Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Thr Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Glu Lys Ile Glu Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Val Glu Glu Glu Gln Asn Lys Ser Gln

100 105 110

Gln Lys Thr Gln Gln Ala Lys Ala Ala Asp Gly Lys Val Ser Gln Asn

115 120 125

Tyr Pro Ile Val Gln Asn Ala Gln Gly Gln Met Val His Gln Ala Leu

130 135 140

Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys Ala

145 150 155 160

Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser Glu Gly Ala

165 170 175

Thr Pro Ser Asp Leu Asn Thr Met Leu Asn Thr Ile Gly Gly His Gln

180 185 190

Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu Ala Ala Glu

195 200 205

Trp Asp Arg Val His Pro Val His Ala Gly Pro Val Ala Pro Gly Gln

210 215 220

Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Ser Thr Ser Thr Leu

225 230 235 240

Gln Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Pro Ile Pro Val Gly

245 250 255

Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Lys

260 265 270

Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly Pro Lys Glu

275 280 285

Pro Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys Thr Leu Arg Ala Glu

290 295 300

Gln Ala Thr Gln Asp Val Lys Asn Trp Met Thr Asp Thr Leu Leu Val

305 310 315 320

Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Arg Ala Leu Gly Pro

325 330 335

Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly

340 345 350

Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Ala Asn

355 360 365

Ser Asn Ile Met Met Gln Arg Ser Asn Phe Lys Gly Pro Lys Arg Ile

370 375 380

Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile Ala Lys Asn Cys

385 390 395 400

Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Arg Glu Gly His

405 410 415

Gln Met Lys Asp Cys Asn Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile

420 425 430

Trp Pro Ser Asn Lys Gly Arg Pro Gly Asn Phe Leu Gln Asn Arg Pro

435 440 445

Glu Pro Thr Ala Pro Pro Leu Gln Ser Arg Leu Glu Pro Thr Ala Pro

450 455 460

Leu Glu Pro Thr Ala Pro Pro Glu Pro Thr Ala Pro Pro Ala Val Val

465 470 475 480

Pro Thr Ala Pro Pro Val Glu Pro Thr Ala Pro Pro Ala Glu Pro Thr

485 490 495

Ala Pro Pro Ala Glu Ser Phe Arg Phe Glu Glu Thr Thr Pro Ala Pro

500 505 510

Lys Gln Glu Pro Lys Asp Arg Glu Pro Leu Thr Ser Leu Lys Ser Leu

515 520 525

Phe Gly Ser Asp Pro Leu Ser Gln

530 535

<210> 759

<211> 231

<212> PRT

<213> Artificial Sequence

<220><223> HIV M gag CEN-2 Conserved, Tailored

<400> 759

Pro Ile Val Gln Asn Ala Gln Gly Gln Met Val His Gln Ala Leu Ser
1 5 10 15

Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys Ala Phe
20 25 30

Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser Glu Gly Ala Thr
35 40 45

Pro Ser Asp Leu Asn Thr Met Leu Asn Thr Ile Gly Gly His Gln Ala
50 55 60

Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu Ala Ala Glu Trp
65 70 75 80

Asp Arg Val His Pro Val His Ala Gly Pro Val Ala Pro Gly Gln Met
85 90 95

Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Ser Thr Ser Thr Leu Gln
100 105 110

Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Pro Ile Pro Val Gly Asp
115 120 125

Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Lys Met
130 135 140

Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly Pro Lys Glu Pro
145 150 155 160

Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys Thr Leu Arg Ala Glu Gln
165 170 175

Ala Thr Gln Asp Val Lys Asn Trp Met Thr Asp Thr Leu Leu Val Gln
180 185 190

Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Arg Ala Leu Gly Pro Gly

195 200 205

Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro

210 215 220

Ser His Lys Ala Arg Val Leu

225 230

<210> 760

<211> 520

<212> PRT

<213> Artificial Sequence

<220><223> HIV M gag CEN-3, Tailored

<400> 760

Met Gly Ser Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Asp Thr Gly Asn Asn Ser

115 120 125

Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met

130 135 140

Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala
165 170 175
Leu Ser Glu Gly Ala Thr Pro Ser Asp Leu Asn Thr Met Leu Asn Thr
180 185 190
Ile Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn
195 200 205
Glu Glu Ala Ala Asp Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro

210 215 220
Val Ala Pro Gly Gln Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly
225 230 235 240
Thr Thr Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro
245 250 255
Pro Ile Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu
260 265 270
Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys

275 280 285
Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys
290 295 300
Thr Leu Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr
305 310 315 320
Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335
Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys

340 345 350
Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala
355 360 365
Met Ser Gln Ala Thr Asn Ser Ala Ala Ile Met Met Gln Arg Gly Asn
370 375 380
Phe Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400
Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp

405 410 415

Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Asn Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Arg Ile Trp Pro Ser Asn Lys Gly Arg Pro Gly

435 440 445

Asn Phe Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Asn Phe Leu Gln

450 455 460

Ser Arg Pro Glu Pro Ser Ala Pro Pro Glu Pro Thr Ala Pro Pro Glu

465 470 475 480

Glu Ser Phe Arg Phe Gly Glu Glu Thr Ala Thr Pro Ser Gln Lys Gln

485 490 495

Glu Pro Thr Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Arg Ser Leu

500 505 510

Phe Gly Asn Asp Pro Ser Ser Gln

515 520

<210> 761

<211> 231

<212> PRT

<213> Artificial Sequence

<220><223> HIV M gag CEN-3 Conserved, Tailored

<400> 761

Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His Gln Ala Leu Ser

1 5 10 15

Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys Ala Phe

20 25 30

Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser Glu Gly Ala Thr

35 40 45

Pro Ser Asp Leu Asn Thr Met Leu Asn Thr Ile Gly Gly His Gln Ala

50 55 60

Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu Ala Ala Asp Trp

65 70 75 80

Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala Pro Gly Gln Met

85 90 95

Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Asn Leu Gln

100 105 110

Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile Pro Val Gly Asp

115 120 125

Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys Ile Val Arg Met

130 135 140

Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly Pro Lys Glu Pro

145 150 155 160

Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys Thr Leu Arg Ala Glu Gln

165 170 175

Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln

180 185 190

Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro Gly

195 200 205

Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro

210 215 220

Ser His Lys Ala Arg Val Leu

225 230

<210> 762

<211> 506

<212> PRT

<213> Artificial Sequence

<220><223> HIV M gag CEN-4, Tailored

<400> 762

Met Gly Thr Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys

100 105 110

Lys Lys Ala Gln Gln Thr Ala Ala Asp Thr Gly Asn Asn Ser Gln Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His

130 135 140

Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro His Asp Leu Asn Thr Met Leu Asn Thr Ile Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Val Ala

210 215 220

Pro Gly Gln Met Arg Glu Pro Lys Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile

245 250 255

Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Ser Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Ser His Lys Ala Arg Ile Leu Ala Glu Ala Met Ser

355 360 365

Gln Ala Thr Asn Ser Ala Asn Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys

405 410 415

Gly Arg Glu Gly His Gln Met Lys Asp Cys Asn Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Glu Pro Thr Ala Pro

450 455 460

Pro Glu Glu Ser Phe Gly Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln

465 470 475 480

Lys Gln Glu Pro Ile Asp Lys Asp Leu Tyr Pro Leu Ala Ser Leu Arg

485 490 495

Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505

<210> 763

<211> 231

<212> PRT

<213> Artificial Sequence

<220><223> HIV M gag CEN-4 Conserved, Tailored

<400> 763

Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His Gln Pro Ile Ser
1 5 10 15

Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys Ala Phe
20 25 30

Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser Glu Gly Ala Thr
35 40 45

Pro His Asp Leu Asn Thr Met Leu Asn Thr Ile Gly Gly His Gln Ala
50 55 60

Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu Ala Ala Glu Trp
65 70 75 80

Asp Arg Val His Pro Val His Ala Gly Pro Val Ala Pro Gly Gln Met
85 90 95

Arg Glu Pro Lys Gly Ser Asp Ile Ala Gly Thr Thr Ser Asn Leu Gln
100 105 110

Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile Pro Val Gly Asp
115 120 125

Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys Ile Val Arg Met
130 135 140

Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly Pro Lys Glu Pro
145 150 155 160

Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys Thr Leu Arg Ala Glu Gln
165 170 175

Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln
180 185 190

Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro Gly
195 200 205

Ala Thr Leu Glu Glu Met Met Ser Ala Cys Gln Gly Val Gly Gly Pro
210 215 220

Ser His Lys Ala Arg Ile Leu
225 230

<210> 764

<211> 514

<212> PRT

<213> Artificial Sequence

<220><223> HIV M gag CEN-5, Tailored

<400> 764

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Lys Leu Asp Ala Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Met Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Asp Arg Phe Ala Leu Asn Pro

35 40 45

Ser Leu Leu Glu Thr Ala Glu Gly Cys Gln Gln Ile Met Glu Gln Leu

50 55 60

Gln Pro Ala Leu Lys Thr Gly Thr Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Ile Gln Asn Lys Ser Lys

100 105 110

Gln Lys Thr Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Lys Val

115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Ala Gln Gly Gln Met Ile His

130 135 140

Gln Ser Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu

145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser

165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Met Met Leu Asn Ile Val Gly

180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu

195 200 205

Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Pro
210 215 220
Pro Gly Gln Met Arg Glu Pro Arg Gly Gly Asp Ile Ala Gly Thr Thr
225 230 235 240
Ser Thr Pro Gln Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile
245 250 255
Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu His Lys

260 265 270
Leu Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly
275 280 285
Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys Thr Leu
290 295 300
Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Gly Trp Met Thr Glu Thr
305 310 315 320
Leu Leu Ile Gln Asn Ala Asn Pro Asp Cys Lys Ser Ile Leu Arg Ala

325 330 335
Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly
340 345 350
Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser
355 360 365
Gln Val Gln His Thr Asn Ile Met Met Gln Arg Gly Asn Phe Arg Gly
370 375 380
Gln Lys Arg Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His Leu Ala

385 390 395 400
Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys Gly Arg
405 410 415
Glu Gly His Gln Met Lys Asp Cys Asn Glu Arg Gln Ala Asn Phe Leu
420 425 430
Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly Asn Phe Pro Gln
435 440 445
Ser Arg Pro Glu Pro Thr Ala Pro Gln Asn Arg Leu Glu Pro Thr Ala

450 455 460

Pro Pro Ala Glu Pro Thr Ala Pro Pro Ala Glu Ile Phe Gly Met Gly

465 470 475 480

Glu Glu Ile Thr Ser Pro Pro Lys Gln Glu Gln Lys Asp Arg Glu Gln

485 490 495

Ala Pro Pro Leu Val Ser Leu Lys Ser Leu Phe Gly Asn Asp Leu Leu

500 505 510

Ser Gln

<210> 765

<211> 231

<

212> PRT

<213> Artificial Sequence

<220><223> HIV M gag CEN-5 Conserved, Tailored

<400> 765

Pro Ile Val Gln Asn Ala Gln Gly Gln Met Ile His Gln Ser Leu Ser

1 5 10 15

Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys Ala Phe

20 25 30

Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser Glu Gly Ala Thr

35 40 45

Pro Gln Asp Leu Asn Met Met Leu Asn Ile Val Gly Gly His Gln Ala

50 55 60

Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu Ala Ala Glu Trp

65 70 75 80

Asp Arg Val His Pro Val His Ala Gly Pro Ile Pro Pro Gly Gln Met

85 90 95

Arg Glu Pro Arg Gly Gly Asp Ile Ala Gly Thr Thr Ser Thr Pro Gln

100 105 110

Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile Pro Val Gly Asp

115 120 125

Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu His Lys Leu Val Arg Met

130 135 140

Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly Pro Lys Glu Pro

145 150 155 160

Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys Thr Leu Arg Ala Glu Gln

165 170 175

Ala Thr Gln Glu Val Lys Gly Trp Met Thr Glu Thr Leu Leu Ile Gln

180 185 190

Asn Ala Asn Pro Asp Cys Lys Ser Ile Leu Arg Ala Leu Gly Pro Gly

195 200 205

Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro

210 215 220

Ser His Lys Ala Arg Val Leu

225 230

<210> 766

<211> 498

<212> PRT

<213> Artificial Sequence

<220><223> HIV C gag episensus EG-0, Tailored

<400

> 766

Met Gly Ala Arg Ala Ser Ile Leu Arg Gly Gly Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys His Tyr Met Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Met Lys Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Thr Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Glu Lys Ile Glu Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Gln

100 105 110

Gln Lys Thr Gln Gln Ala Lys Ala Ala Asp Gly Lys Val Ser Gln Asn

115 120 125

Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln Ala Ile

130 135 140

Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys Ala

145 150 155 160

Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser Glu Gly Ala

165 170 175

Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His Gln

180 185 190

Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu Ala Ala Glu

195 200 205

Trp Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala Pro Gly Gln

210 215 220

Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu

225 230 235 240

Gln Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Pro Ile Pro Val Gly

245 250 255

Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg

260 265 270

Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly Pro Lys Glu

275 280 285

Pro Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys Thr Leu Arg Ala Glu

290 295 300

Gln Ala Thr Gln Asp Val Lys Asn Trp Met Thr Asp Thr Leu Leu Val

305 310 315 320

Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Arg Ala Leu Gly Pro

325 330 335

Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly

340 345 350

Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Ala Asn
355 360 365
Ser Asn Ile Met Met Gln Arg Ser Asn Phe Lys Gly Pro Lys Arg Ile
370 375 380

Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile Ala Arg Asn Cys
385 390 395 400
Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Lys Glu Gly His
405 410 415
Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile
420 425 430
Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu Gln Ser Arg Pro
435 440 445

Glu Pro Thr Ala Pro Pro Ala Glu Pro Thr Ala Pro Pro Ala Glu Ser
450 455 460
Phe Arg Phe Glu Glu Thr Thr Pro Ala Pro Lys Gln Glu Pro Lys Asp
465 470 475 480
Arg Glu Pro Leu Thr Ser Leu Lys Ser Leu Phe Gly Ser Asp Pro Leu
485 490 495
Ser Gln

<210> 767
<211> 231
<212> PRT
<213> Artificial Sequence
<220><223> HIV C gag episensus EG-0 Conserved, Tailored

<400> 767
Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln Ala Ile Ser
1 5 10 15
Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys Ala Phe
20 25 30
Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser Glu Gly Ala Thr
35 40 45

Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His Gln Ala
50 55 60

Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu Ala Ala Glu Trp
65 70 75 80
Asp Arg Leu His Pro Val His Ala Gly Pro Val Ala Pro Gly Gln Met
85 90 95
Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln
100 105 110
Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Pro Ile Pro Val Gly Asp
115 120 125

Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg Met
130 135 140
Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly Pro Lys Glu Pro
145 150 155 160
Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys Thr Leu Arg Ala Glu Gln
165 170 175
Ala Thr Gln Asp Val Lys Asn Trp Met Thr Asp Thr Leu Leu Val Gln
180 185 190

Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Arg Ala Leu Gly Pro Gly
195 200 205
Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro
210 215 220
Gly His Lys Ala Arg Val Leu
225 230

<210> 768
<211> 509
<212> PRT
<213> Artificial Sequence
<220><223> HIV C gag CEN-1, Tailored
<400> 768
Met Gly Ala Arg Ala Ser Ile Leu Arg Gly Glu Lys Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Lys Leu Arg Pro Gly Gly Lys Lys Arg Tyr Met Leu Lys

20 25 30

His Leu Ile Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro

35 40 45

Ser Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Ile Lys Gln Leu

50 55 60

Gln Pro Ala Leu Lys Thr Gly Thr Glu Glu Leu Arg Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Ala Gly Ile Glu Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Arg Ile Glu Glu Glu Gln Asn Lys Cys Gln

100 105 110

Gln Lys Thr Gln Gln Ala Glu Ala Ala Asp Lys Gly Lys Val Ser Gln

115 120 125

Asn Tyr Pro Ile Val Gln Asn Ala Gln Gly Gln Met Val His Gln Ala

130 135 140

Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys

145 150 155 160

Ala Phe Ser Pro Glu Ile Ile Pro Met Phe Thr Ala Leu Ser Glu Gly

165 170 175

Ala Thr Pro Ser Asp Leu Asn Ser Met Leu Asn Thr Val Gly Gly His

180 185 190

Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn Asp Glu Ala Ala

195 200 205

Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala Pro Gly

210 215 220

Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Asn

225 230 235 240

Leu Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile Pro Val

245 250 255

Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val

260 265 270

Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys

275 280 285

Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys Cys Leu Arg Ala

290 295 300

Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Asp Thr Leu Leu

305 310 315 320

Ile Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly

325 330 335

Pro Gly Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly

340 345 350

Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Val

355 360 365

Asn Asn Ala Asn Ile Met Met Gln Arg Gly Asn Phe Lys Gly Pro Lys

370 375 380

Arg Ile Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His Leu Ala Arg

385 390 395 400

Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Gln Glu

405 410 415

Gly His Gln Met Lys Asp Cys Ser Asn Glu Arg Gln Ala Asn Phe Leu

420 425 430

Gly Lys Leu Trp Pro Ser His Lys Gly Gly Arg Pro Gly Asn Phe Leu

435 440 445

Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Val Glu Pro Thr Ala Pro

450 455 460

Pro Ala Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Lys Phe Glu Glu

465 470 475 480

Thr Thr Pro Val Pro Lys Gln Glu Leu Lys Asp Arg Glu Pro Leu Ile

485 490 495

Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Leu Ser Gln

500 505

<210> 769

<211> 230

<212> PRT

<213> Artificial Sequence

<220

><223> HIV C gag CEN-1 Conserved, Tailored

<400> 769

Ile Val Gln Asn Ala Gln Gly Gln Met Val His Gln Ala Leu Ser Pro
1 5 10 15

Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys Ala Phe Ser
20 25 30

Pro Glu Ile Ile Pro Met Phe Thr Ala Leu Ser Glu Gly Ala Thr Pro
35 40 45

Ser Asp Leu Asn Ser Met Leu Asn Thr Val Gly Gly His Gln Ala Ala

50 55 60

Met Gln Met Leu Lys Asp Thr Ile Asn Asp Glu Ala Ala Glu Trp Asp
65 70 75 80

Arg Val His Pro Val His Ala Gly Pro Ile Ala Pro Gly Gln Met Arg
85 90 95

Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Asn Leu Gln Glu
100 105 110

Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile Pro Val Gly Glu Ile

115 120 125

Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg Met Tyr
130 135 140

Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe
145 150 155 160

Arg Asp Tyr Val Asp Arg Phe Phe Lys Cys Leu Arg Ala Glu Gln Ala
165 170 175

Thr Gln Glu Val Lys Asn Trp Met Thr Asp Thr Leu Leu Ile Gln Asn

180 185 190

Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro Gly Ala
195 200 205
Ser Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro Ser
210 215 220
His Lys Ala Arg Val Leu
225 230

<210> 770
<211> 515
<212> PRT
<213> Artificial Sequence
<220><223> HIV C gag CEN-2, Tailored
<400> 770

Met Gly Ala Arg Ala Ser Ile Leu Arg Gly Glu Lys Leu Asp Lys Trp

1 5 10 15
Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys His Tyr Met Ile Lys
20 25 30
His Leu Val Trp Ala Ser Arg Glu Leu Glu Lys Phe Ala Leu Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ala Asp Gly Cys Lys Gln Ile Ile Lys Gln Leu
50 55 60
His Pro Ala Leu Gln Thr Gly Thr Glu Glu Leu Lys Ser Leu Tyr Asn

65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Glu Arg Ile Glu Val Arg Asp
85 90 95
Thr Lys Glu Ala Leu Asp Arg Ile Glu Glu Glu Gln Asn Lys Cys Gln
100 105 110
Gln Lys Thr Gln Gln Ala Glu Ala Ala Asp Lys Gly Lys Val Ser Gln
115 120 125
Asn Tyr Pro Ile Val Gln Asn Ala Gln Gly Gln Met Val His Gln Pro

130 135 140
Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys
145 150 155 160

Ala Phe Ser Pro Glu Ile Ile Pro Met Phe Thr Ala Leu Ser Glu Gly
165 170 175
Ala Thr Pro Thr Asp Leu Asn Thr Met Leu Asn Thr Ile Gly Gly His
180 185 190
Gln Ala Ala Met Gln Ile Leu Lys Asp Thr Ile Asn Glu Glu Ala Val

195 200 205
Glu Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala Pro Gly
210 215 220
Gln Ile Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Asn
225 230 235 240
Leu Gln Glu Gln Ile Ala Trp Met Thr Gly Asn Pro Pro Val Pro Val
245 250 255
Gly Asp Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys Ile Val

260 265 270
Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys
275 280 285
Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys Val Leu Arg Ala
290 295 300
Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu
305 310 315 320
Val Gln Asn Ala Asn Pro Asp Cys Lys Ile Ile Leu Lys Gly Leu Gly

325 330 335
Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly
340 345 350
Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Val
355 360 365
Asn Asn Thr Asn Ile Met Met Gln Lys Ser Asn Phe Lys Gly Pro Lys
370 375 380
Arg Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile Ala Lys

385 390 395 400
Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Arg Glu

405 410 415

Gly His Gln Met Lys Asp Cys Asn Glu Arg Gln Ala Asn Phe Leu Gly

420 425 430

Lys Ile Trp Pro Ser Gln Lys Gly Arg Pro Gly Asn Phe Leu Gln Asn

435 440 445

Arg Pro Glu Pro Thr Ala Pro Arg Pro Glu Pro Thr Ala Pro Pro Arg

450 455 460

Leu Glu Pro Thr Ala Pro Pro Ala Glu Pro Ser Ala Pro Pro Ala Glu

465 470 475 480

Ser Phe Arg Phe Glu Gly Thr Thr Pro Ala Pro Lys Gln Glu Ser Lys

485 490 495

Asp Arg Glu Pro Leu Ile Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro

500 505 510

Leu Ser Gln

515

<210> 771

<211> 231

<212> PRT

<213> Artificial Sequence

<220><223> HIV C gag CEN-2 Conserved, Tailored

<400> 771

Pro Ile Val Gln Asn Ala Gln Gly Gln Met Val His Gln Pro Ile Ser

1 5 10 15

Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys Ala Phe

20 25 30

Ser Pro Glu Ile Ile Pro Met Phe Thr Ala Leu Ser Glu Gly Ala Thr

35 40 45

Pro Thr Asp Leu Asn Thr Met Leu Asn Thr Ile Gly Gly His Gln Ala

50 55 60

Ala Met Gln Ile Leu Lys Asp Thr Ile Asn Glu Glu Ala Val Glu Trp

65 70 75 80

Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala Pro Gly Gln Ile

85 90 95

Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Asn Leu Gln

100 105 110

Glu Gln Ile Ala Trp Met Thr Gly Asn Pro Pro Val Pro Val Gly Asp

115 120 125

Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys Ile Val Arg Met

130 135 140

Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro

145 150 155 160

Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys Val Leu Arg Ala Glu Gln

165 170 175

Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln

180 185 190

Asn Ala Asn Pro Asp Cys Lys Ile Ile Leu Lys Gly Leu Gly Pro Ala

195 200 205

Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro

210 215 220

Ser His Lys Ala Arg Val Leu

225 230

<210> 772

<211> 523

<212> PRT

<213> Artificial Sequence

<220><223> HIV C gag CEN-3, Tailored

<400> 772

Met Gly Ala Arg Ala Ser Ile Leu Arg Gly Glu Lys Leu Asp Arg Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Cys Tyr Met Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ser Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Lys Gln Ile Ile Lys Gln Leu

50 55 60

His Pro Ala Leu Gln Thr Gly Thr Glu Glu Leu Lys Ser Leu Phe Asn
65 70 75 80
Thr Val Ala Thr Leu Tyr Cys Val His Lys Lys Ile Asp Val Arg Asp
85 90 95
Thr Lys Glu Ala Leu Asp Lys Val Glu Glu Glu Gln Asn Lys Cys Gln
100 105 110
Gln Lys Thr Gln Gln Ala Lys Ala Ala Asp Glu Lys Val Ser Gln Asn
115 120 125

Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His Gln Ala Leu
130 135 140
Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys Ala
145 150 155 160
Phe Ser Pro Glu Ile Ile Pro Met Phe Thr Ala Leu Ser Glu Glu Ala
165 170 175
Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Ala Val Gly Gly His Gln
180 185 190

Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu
195 200 205
Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala Pro Gly Gln
210 215 220
Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Asn Leu
225 230 235 240
Gln Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile Pro Val Gly
245 250 255

Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg
260 265 270
Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu
275 280 285
Pro Phe Arg Asp Tyr Val Asp Arg Phe Phe Arg Val Leu Arg Ala Glu
290 295 300

Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Asp Thr Leu Leu Ile
305 310 315 320

Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro
325 330 335
Gly Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly
340 345 350
Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Ala Asn
355 360 365
Asn Ile Asn Ile Met Met Gln Arg Gly Asn Phe Lys Gly Pro Lys Arg
370 375 380

Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile Ala Lys Asn
385 390 395 400
Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys Gly Lys Glu Gly
405 410 415
His Gln Met Lys Asp Cys Asn Glu Arg Gln Ala Asn Phe Leu Gly Arg
420 425 430
Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu Gln Asn Arg
435 440 445

Pro Glu Pro Thr Ala Pro Ser Ala Glu Ser Phe Arg Gln Asn Arg Thr
450 455 460
Glu Pro Thr Ala Pro Pro Ala Arg Leu Glu Pro Thr Ala Pro Pro Ala
465 470 475 480
Glu Pro Ser Ala Pro Pro Val Glu Ser Phe Arg Phe Glu Glu Thr Thr
485 490 495
Pro Ala Leu Lys Gln Glu Ser Lys Asp Arg Glu Pro Leu Thr Ser Leu
500 505 510

Arg Ser Leu Phe Gly Ser Asp Pro Leu Phe Gln
515 520

<210> 773
<211> 231
<212> PRT

<213> Artificial Sequence

<220><223> HIV C gag CEN-3 Conserved, Tailored

<400> 773

Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His Gln Ala Leu Ser
1 5 10 15

Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys Ala Phe
20 25 30

Ser Pro Glu Ile Ile Pro Met Phe Thr Ala Leu Ser Glu Glu Ala Thr

35 40 45

Pro Gln Asp Leu Asn Thr Met Leu Asn Ala Val Gly Gly His Gln Ala
50 55 60

Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp
65 70 75 80

Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala Pro Gly Gln Met
85 90 95

Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Asn Leu Gln

100 105 110

Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Ile Pro Val Gly Glu
115 120 125

Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg Met
130 135 140

Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro
145 150 155 160

Phe Arg Asp Tyr Val Asp Arg Phe Phe Arg Val Leu Arg Ala Glu Gln

165 170 175

Ala Thr Gln Glu Val Lys Asn Trp Met Thr Asp Thr Leu Leu Ile Gln
180 185 190

Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro Gly
195 200 205

Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro
210 215 220

Ser His Lys Ala Arg Val Leu

225 230

<210> 774

<211> 513

<212> PRT

<213> Artificial Sequence

<220><223> HIV C gag CEN-4, Tailored

<400> 774

Met Gly Ala Arg Ala Ser Val Leu Arg Gly Glu Lys Leu Asp Lys Trp
1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Met Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Lys Phe Ala Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Lys Gln Ile Ile Lys Gln Leu
50 55 60

His Pro Ala Leu Gln Thr Gly Thr Glu Glu Leu Arg Ser Leu Phe Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Lys Gly Ile Asp Val Arg Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Val Glu Glu Glu Gln Asn Lys Cys Gln
100 105 110

Gln Lys Thr Gln Gln Ala Glu Ala Asp Lys Lys Val Ser Gln Asn Tyr
115 120 125

Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His Gln Pro Leu Ser
130 135 140

Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys Ala Phe
145 150 155 160

Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu Gly Ala Thr
165 170 175

Pro Gly Asp Leu Asn Thr Met Leu Asn Thr Ile Gly Gly His Gln Ala
180 185 190

Ala Met Gln Met Leu Lys Asp Thr Ile Asn Asp Glu Ala Ala Glu Trp
195 200 205
Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala Pro Gly Gln Met
210 215 220
Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Asn Leu Gln
225 230 235 240

Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Val Pro Val Gly Glu
245 250 255
Ile Tyr Lys Arg Trp Ile Val Leu Gly Leu Asn Lys Ile Val Arg Met
260 265 270
Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro
275 280 285
Phe Arg Asp Tyr Val Asp Arg Phe Phe Arg Thr Leu Arg Ala Glu Gln
290 295 300

Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln
305 310 315 320
Asn Ala Asn Pro Asp Cys Lys Asn Ile Leu Arg Ala Leu Gly Pro Gly
325 330 335
Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro
340 345 350
Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Ala Asn Asn
355 360 365

Thr Asn Ile Met Met Gln Lys Ser Asn Phe Lys Gly Pro Arg Arg Ile
370 375 380
Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile Ala Lys Asn Cys
385 390 395 400
Arg Ala Pro Arg Lys Arg Gly Cys Trp Lys Cys Gly Lys Glu Gly His
405 410 415
Gln Met Lys Asp Cys Asn Glu Arg Gln Ala Asn Phe Leu Gly Lys Ile
420 425 430

Trp Pro Ser Asn Lys Gly Arg Pro Gly Asn Phe Leu Gln Asn Arg Pro

435 440 445

Glu Pro Thr Ala Pro Gln Ser Arg Pro Glu Pro Thr Ala Pro Leu Glu

450 455 460

Pro Thr Ala Pro Pro Ala Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe

465 470 475 480

Lys Phe Glu Glu Thr Thr Pro Ala Pro Lys Gln Glu Gln Lys Asp Arg

485 490 495

Glu Pro Leu Ile Ser Leu Lys Ser Leu Phe Gly Asn Asp Pro Leu Ser

500 505 510

Gln

<210> 775

<211> 231

<212> PRT

<213> Artificial Sequence

<220><223> HIV C gag CEN-4 Conserved, Tailored

<400> 775

Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His Gln Pro Leu Ser

1 5 10 15

Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys Ala Phe

20 25 30

Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu Gly Ala Thr

35 40 45

Pro Gly Asp Leu Asn Thr Met Leu Asn Thr Ile Gly Gly His Gln Ala

50 55 60

Ala Met Gln Met Leu Lys Asp Thr Ile Asn Asp Glu Ala Ala Glu Trp

65 70 75 80

Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala Pro Gly Gln Met

85 90 95

Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Asn Leu Gln

100 105 110

Glu Gln Ile Ala Trp Met Thr Asn Asn Pro Pro Val Pro Val Gly Glu

115 120 125

Ile Tyr Lys Arg Trp Ile Val Leu Gly Leu Asn Lys Ile Val Arg Met

130 135 140

Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro

145 150 155 160

Phe Arg Asp Tyr Val Asp Arg Phe Phe Arg Thr Leu Arg Ala Glu Gln

165 170 175

Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln

180 185 190

Asn Ala Asn Pro Asp Cys Lys Asn Ile Leu Arg Ala Leu Gly Pro Gly

195 200 205

Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro

210 215 220

Ser His Lys Ala Arg Val Leu

225 230

<210> 776

<211> 507

<212> PRT

<213> Artificial Sequence

<220><223> HIV C gag CEN-5, Tailored

<400> 776

Met Gly Ala Arg Ala Ser Val Leu Arg Gly Glu Lys Leu Asp Lys Trp

1 5 10 15

Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Met Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Lys Phe Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Lys Gln Ile Ile Lys Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Thr Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Glu Lys Ile Asp Val Arg Asp

85 90 95

Thr Lys Glu Ala Leu Asp Arg Ile Glu Glu Glu Gln Asn Lys Cys Gln

100 105 110

Gln Lys Thr Gln Gln Ala Lys Ala Ala Asp Glu Lys Val Ser Gln Asn

115 120 125

Tyr Pro Ile Val Gln Asn Ala Gln Gly Gln Met Val His Gln Ala Leu

130 135 140

Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys Gly

145 150 155 160

Phe Asn Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser Asp Gly Ala

165 170 175

Thr Pro Gln Asp Leu Asn Ser Met Leu Asn Thr Val Gly Gly His Gln

180 185 190

Ala Ala Met Gln Ile Leu Lys Asp Thr Ile Asn Glu Glu Ala Ala Glu

195 200 205

Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala Pro Gly Gln

210 215 220

Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Asn Leu

225 230 235 240

Gln Glu Gln Ile Ala Trp Met Thr Gly Asn Pro Pro Ile Pro Val Gly

245 250 255

Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg

260 265 270

Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu

275 280 285

Pro Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys Ala Leu Arg Ala Glu

290 295 300

Gln Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val

305 310 315 320

Gln Asn Ala Asn Pro Asp Cys Lys Asn Ile Leu Arg Ala Leu Gly Pro

325 330 335

Gly Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly

340 345 350

Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Ala Asn

355 360 365

Asn Thr Asn Ile Met Met Gln Arg Asn Asn Phe Lys Gly Pro Lys Arg

370 375 380

Ile Ile Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile Ala Lys Asn

385 390 395 400

Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Arg Glu Gly

405 410 415

His Gln Met Lys Asp Cys Asn Glu Arg Gln Ala Asn Phe Leu Gly Arg

420 425 430

Ile Trp Pro Ser His Lys Gly Gly Arg Pro Gly Asn Phe Leu Gln Asn

435 440 445

Arg Pro Glu Pro Thr Ala Pro Pro Val Glu Pro Thr Ala Pro Pro Ala

450 455 460

Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Lys Phe Glu Glu Thr Thr

465 470 475 480

Pro Thr Pro Lys Gln Glu Gln Lys Asp Arg Glu Pro Leu Ile Ser Leu

485 490 495

Lys Ser Leu Phe Gly Asn Asp Pro Leu Ser Gln

500 505

<210> 777

<211> 231

<212> PRT

<213> Artificial Sequence

<220><223> HIV C gag CEN-5 Conserved, Tailored

<400> 777

Pro Ile Val Gln Asn Ala Gln Gly Gln Met Val His Gln Ala Leu Ser

1 5 10 15

Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys Gly Phe

20 25 30

Asn Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser Asp Gly Ala Thr
35 40 45
Pro Gln Asp Leu Asn Ser Met Leu Asn Thr Val Gly Gly His Gln Ala
50 55 60
Ala Met Gln Ile Leu Lys Asp Thr Ile Asn Glu Glu Ala Ala Glu Trp
65 70 75 80
Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala Pro Gly Gln Met
85 90 95

Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Asn Leu Gln
100 105 110
Glu Gln Ile Ala Trp Met Thr Gly Asn Pro Pro Ile Pro Val Gly Glu
115 120 125
Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg Met
130 135 140
Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro
145 150 155 160

Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys Ala Leu Arg Ala Glu Gln
165 170 175
Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln
180 185 190
Asn Ala Asn Pro Asp Cys Lys Asn Ile Leu Arg Ala Leu Gly Pro Gly
195 200 205
Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro
210 215 220

Ser His Lys Ala Arg Val Leu
225 230

<210> 778

<211> 506

<212> PRT

<213> Artificial Sequence

<220><223> HIV B gag episensus EG-0, Tailored

<400> 778

Met Gly Ala Arg Ala Ser Val Leu Ser Gly Gly Glu Leu Asp Arg Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Lys Leu Lys
20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ser Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60

Gln Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Thr Leu Tyr Cys Val His Gln Lys Ile Asp Val Lys Asp
85 90 95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Asp Thr Gly Asn Ser Ser Gln Val
115 120 125

Ser Gln Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His
130 135 140

Gln Ala Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu
145 150 155 160

Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser
165 170 175

Glu Gly Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly
180 185 190

Gly His Gln Ala Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu
195 200 205

Ala Ala Glu Trp Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala
210 215 220

Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr

225 230 235 240

Ser Thr Leu Gln Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile

245 250 255

Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys

260 265 270

Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly

275 280 285

Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu

290 295 300

Arg Ala Glu Gln Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr

305 310 315 320

Leu Leu Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala

325 330 335

Leu Gly Pro Ala Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly

340 345 350

Val Gly Gly Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser

355 360 365

Gln Val Thr Asn Ser Ala Thr Ile Met Met Gln Arg Gly Asn Phe Arg

370 375 380

Asn Gln Arg Lys Thr Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His

385 390 395 400

Ile Ala Arg Asn Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys

405 410 415

Gly Lys Glu Gly His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn

420 425 430

Phe Leu Gly Lys Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe

435 440 445

Leu Gln Ser Arg Pro Glu Pro Thr Ala Pro Pro Glu Pro Thr Ala Pro

450 455 460

Pro Glu Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr Thr Pro Ser Gln

465 470 475 480

Lys Gln Glu Pro Ile Asp Lys Glu Leu Tyr Pro Leu Ala Ser Leu Lys

485 490 495

Ser Leu Phe Gly Asn Asp Pro Ser Ser Gln

500 505

<210> 779

<211> 231

<212> PRT

<213> Artificial Sequence

<220><223> HIV B gag episensus EG-0 Conserved, Tailored

<400> 779

Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln Ala Ile Ser

1 5 10 15

Pro Arg Thr Leu Asn Ala Trp Val Lys Val Val Glu Glu Lys Ala Phe

20 25 30

Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ser Glu Gly Ala Thr

35 40 45

Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His Gln Ala

50 55 60

Ala Met Gln Met Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp

65 70 75 80

Asp Arg Leu His Pro Val His Ala Gly Pro Ile Ala Pro Gly Gln Met

85 90 95

Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr Leu Gln

100 105 110

Glu Gln Ile Gly Trp Met Thr Asn Asn Pro Pro Ile Pro Val Gly Glu

115 120 125

Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg Met

130 135 140

Tyr Ser Pro Thr Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu Pro

145 150 155 160

Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln

165 170 175

Ala Ser Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln

180 185 190

Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro Ala

195 200 205

Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro

210 215 220

Gly His Lys Ala Arg Val Leu

225 230

<210> 780

<211> 509

<212> PRT

<213> Artificial Sequence

<220><223> HIV B gag CEN-1, Tailored

<400> 780

Met Gly Ser Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Gln Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Arg Tyr Lys Leu Lys

20 25 30

His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Val Asn Pro

35 40 45

Ser Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Ile Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Ala Asp Thr Gly Asn Ser

115 120 125

Asn Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met Gln Gly Gln

130 135 140

Met Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys

145 150 155 160

Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr

165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Ala Asp Leu Asn Thr Met Leu Asn

180 185 190

Thr Ile Gly Gly His Gln Ala Ala Met Gln Ile Leu Lys Glu Thr Ile

195 200 205

Asn Glu Glu Ala Ala Glu Trp Asp Arg Val His Pro Val His Ala Gly

210 215 220

Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala

225 230 235 240

Gly Ser Thr Ser Thr Leu Gln Glu Gln Ile Ala Trp Met Thr Ser Asn

245 250 255

Pro Pro Ile Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Met Gly

260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Thr Ser Ile Leu Asp Ile

275 280 285

Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr

290 295 300

Lys Thr Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys Asn Trp Met

305 310 315 320

Thr Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile

325 330 335

Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala

340 345 350

Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu

355 360 365

Ala Met Ser Gln Val Thr Thr Pro Pro Ala Ile Met Met Gln Arg Gly

370 375 380

Asn Phe Lys Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys
385 390 395 400
Glu Gly His Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys
405 410 415
Trp Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Ser Glu Arg

420 425 430
Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro
435 440 445
Gly Asn Phe Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu
450 455 460
Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg Phe Gly Glu Glu Thr Ala
465 470 475 480
Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp Lys Glu Met Tyr Pro Leu

485 490 495
Thr Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser Gln
500 505

<210> 781
<211> 231
<212> PRT
<213> Artificial Sequence
<220><223> HIV B gag CEN-1 Conserved, Tailored
<400> 781
Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His Gln Ala Leu Ser
1 5 10 15
Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys Ala Phe
20 25 30

Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser Glu Gly Ala Thr
35 40 45
Pro Ala Asp Leu Asn Thr Met Leu Asn Thr Ile Gly Gly His Gln Ala
50 55 60
Ala Met Gln Ile Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp
65 70 75 80

Asp Arg Val His Pro Val His Ala Gly Pro Val Ala Pro Gly Gln Met
85 90 95

Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Ser Thr Ser Thr Leu Gln
100 105 110
Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Pro Ile Pro Val Gly Asp
115 120 125
Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys Ile Val Arg Met
130 135 140
Tyr Ser Pro Thr Ser Ile Leu Asp Ile Lys Gln Gly Pro Lys Glu Pro
145 150 155 160

Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln
165 170 175
Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln
180 185 190
Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro Gly
195 200 205
Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro
210 215 220

Ser His Lys Ala Arg Val Leu
225 230

<210> 782
<211> 513
<212> PRT
<213> Artificial Sequence
<220><223> HIV B gag CEN-2, Tailored
<400> 782
Met Gly Ser Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys
20 25 30
His Leu Val Trp Ala Ser Arg Glu Leu Glu Arg Tyr Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Gly Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Asp Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Ser Lys

100 105 110

Lys Lys Thr Gln Gln Ala Ala Ala Asp Thr Gly Asn Asn Ser Gln Val

115 120 125

Lys Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln Met

130 135 140

Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val

145 150 155 160

Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala

165 170 175

Leu Ser Glu Gly Ala Thr Pro His Asp Leu Asn Thr Met Leu Asn Thr

180 185 190

Ile Gly Gly His Gln Ala Ala Met Gln Ile Leu Lys Glu Thr Ile Asn

195 200 205

Asp Glu Ala Ala Glu Trp Asp Arg Thr His Pro Val His Ala Gly Pro

210 215 220

Val Ala Pro Gly Gln Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly

225 230 235 240

Thr Thr Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr His Asn Pro

245 250 255

Pro Ile Pro Val Gly Asp Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu

260 265 270

Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys

275 280 285

Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys

290 295 300

Ile Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met Thr
305 310 315 320
Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu
325 330 335
Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys
340 345 350
Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala

355 360 365

Met Ser Gln Met Thr Asn Ser Ala Thr Ile Met Met Gln Lys Gly Asn
370 375 380
Phe Arg Asn Gln Arg Lys Thr Ile Lys Cys Phe Asn Cys Gly Lys Glu
385 390 395 400
Gly His Leu Ala Arg Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys Trp
405 410 415
Lys Cys Gly Gln Glu Gly His Gln Met Lys Asp Cys Asn Glu Arg Gln

420 425 430

Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Ser Lys Gly Arg Pro Gly
435 440 445
Asn Phe Leu Gln Ser Arg Pro Glu Ser Arg Pro Glu Pro Thr Ala Pro
450 455 460
Pro Ala Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg Phe Gly Glu
465 470 475 480
Glu Thr Ala Thr Pro Pro Gln Lys Gln Glu Pro Ile Asp Lys Glu Met

485 490 495

Tyr Pro Leu Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Ser Ser

500 505 510

Lys

<210> 783

<211> 231

<212> PRT

<213> Artificial Sequence

<220><223> HIV B gag CEN-2 Conserved, Tailored

<400> 783

Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His Gln Ala Leu Ser
1 5 10 15
Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys Ala Phe

20 25 30
Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser Glu Gly Ala Thr
35 40 45
Pro His Asp Leu Asn Thr Met Leu Asn Thr Ile Gly Gly His Gln Ala
50 55 60
Ala Met Gln Ile Leu Lys Glu Thr Ile Asn Asp Glu Ala Ala Glu Trp
65 70 75 80
Asp Arg Thr His Pro Val His Ala Gly Pro Val Ala Pro Gly Gln Met

85 90 95
Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Asn Leu Gln
100 105 110
Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile Pro Val Gly Asp
115 120 125
Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys Ile Val Arg Met
130 135 140
Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly Pro Lys Glu Pro

145 150 155 160
Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Ile Leu Arg Ala Glu Gln
165 170 175
Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln
180 185 190
Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro Gly
195 200 205

Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro

210 215 220

Ser His Lys Ala Arg Val Leu

225 230

<210> 784

<211> 510

<212> PRT

<213> Artificial Sequence

<220><223> HIV B gag CEN-3, Tailored

<400> 784

Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Lys Trp

1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Gln Tyr Lys Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Phe Ala Leu Asn Pro

35 40 45

Gly Leu Leu Glu Thr Ser Gly Gly Cys Arg Gln Ile Leu Glu Gln Leu

50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn

65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Ala Ala Asp Thr Gly Asn Asn

115 120 125

Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Ile Gln Gly Gln

130 135 140

Met Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala Trp Val Lys

145 150 155 160

Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr

165 170 175

Ala Leu Ser Glu Gly Ala Thr Pro Gly Asp Leu Asn Leu Met Leu Asn

180 185 190

Ala Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile

195 200 205

Asn Glu Glu Ala Ala Asp Trp Asp Arg Leu His Pro Val Gln Ala Gly

210 215 220

Pro Val Ala Pro Gly Gln Leu Arg Glu Pro Arg Gly Ser Asp Ile Ala

225 230 235 240

Gly Thr Thr Ser Asn Leu Gln Glu Gln Ile Ala Trp Met Thr His Asn

245 250 255

Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met Gly

260 265 270

Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile

275 280 285

Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Tyr

290 295 300

Arg Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp Met

305 310 315 320

Thr Glu Thr Leu Leu Ile Gln Asn Ala Asn Pro Asp Cys Arg Thr Ile

325 330 335

Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr Ala

340 345 350

Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu

355 360 365

Ala Met Ser Gln Ala Thr Ser Ser Ala Thr Ile Met Met Gln Lys Gly

370 375 380

Asn Phe Arg Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly Lys

385 390 395 400

Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly Cys

405 410 415

Trp Lys Cys Gly Arg Glu Gly His Gln Met Lys Asp Cys Ser Glu Arg
420 425 430

Gln Ala Asn Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg Pro
435 440 445

Gly Asn Phe Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Ala Glu
450 455 460

Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg Phe Gly Glu Glu Thr Thr
465 470 475 480

Thr Pro Pro Gln Lys Gln Glu Pro Thr Asp Lys Glu Leu Tyr Pro Leu
485 490 495

Ala Ser Leu Arg Ser Leu Phe Gly Asn Asp Pro Leu Ser Gln
500 505 510

<210> 785

<211> 231

<212> PRT

<213> Artificial Sequence

<220><223> HIV B gag CEN-3 Conserved, Tailored

<400> 785

Pro Ile Val Gln Asn Ile Gln Gly Gln Met Val His Gln Ala Leu Ser
1 5 10 15

Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys Ala Phe
20 25 30

Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser Glu Gly Ala Thr
35 40 45

Pro Gly Asp Leu Asn Leu Met Leu Asn Ala Val Gly Gly His Gln Ala
50 55 60

Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu Ala Ala Asp Trp
65 70 75 80

Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala Pro Gly Gln Leu
85 90 95

Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Asn Leu Gln
100 105 110

Glu Gln Ile Ala Trp Met Thr His Asn Pro Pro Ile Pro Val Gly Glu
115 120 125
Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys Ile Val Arg Met
130 135 140

Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly Pro Lys Glu Pro
145 150 155 160
Phe Arg Asp Tyr Val Asp Arg Phe Tyr Arg Thr Leu Arg Ala Glu Gln
165 170 175
Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr Leu Leu Ile Gln
180 185 190
Asn Ala Asn Pro Asp Cys Arg Thr Ile Leu Lys Ala Leu Gly Pro Gly
195 200 205

Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro
210 215 220
Ser His Lys Ala Arg Val Leu
225 230
<210> 786
<211> 506
<212> PRT
<213> Artificial Sequence
<220><223> HIV B gag CEN-4, Tailored
<400> 786
Met Gly Ala Arg Ala Ser Ile Leu Ser Gly Gly Glu Leu Asp Lys Trp
1 5 10 15
Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Arg Leu Lys

20 25 30
His Ile Val Trp Ala Ser Asn Glu Leu Glu Arg Phe Ala Leu Asn Pro
35 40 45
Gly Leu Leu Glu Thr Ser Asp Gly Cys Arg Gln Ile Leu Gly Gln Leu
50 55 60
His Pro Ser Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Arg Ile Glu Ile Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Ile Glu Glu Glu Gln Asn Lys Cys Lys

100 105 110

Lys Lys Ala Gln Gln Ala Ala Ala Ala Gln Gln Ala Ala Ala Gly Thr

115 120 125

Gly Asn Asn Ser Gln Val Ser Gln Asn Tyr Pro Ile Val Gln Asn Met

130 135 140

Gln Gly Gln Met Val His Gln Ala Leu Ser Pro Arg Thr Leu Asn Ala

145 150 155 160

Trp Val Lys Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro

165 170 175

Met Phe Thr Ala Leu Ser Glu Gly Ala Thr Pro His Asp Leu Asn Thr

180 185 190

Met Leu Asn Thr Ile Gly Gly His Gln Ala Ala Met Gln Ile Leu Lys

195 200 205

Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Val His Pro Val

210 215 220

His Ala Gly Pro Ile Ala Pro Gly Gln Ile Arg Glu Pro Arg Gly Ser

225 230 235 240

Asp Ile Ala Gly Thr Thr Ser Asn Leu Gln Glu Gln Ile Gly Trp Met

245 250 255

Thr His Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Lys Trp Ile

260 265 270

Ile Met Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile

275 280 285

Leu Asp Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp

290 295 300

Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln Ala Thr Gln Glu Val Lys

305 310 315 320

Asn Trp Met Thr Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys

325 330 335

Lys Thr Ile Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met

340 345 350

Met Thr Ala Cys Gln Gly Val Gly Gly Pro Ala His Lys Ala Arg Val

355 360 365

Leu Ala Glu Ala Met Ser Gln Ala Thr Asn Ser Ala Ala Ile Met Met

370 375 380

Gln Lys Gly Asn Phe Arg Asn Gln Arg Arg Thr Val Lys Cys Phe Asn

385 390 395 400

Cys Gly Lys Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys

405 410 415

Lys Gly Cys Trp Lys Cys Gly Gln Glu Gly His Gln Met Lys Asp Cys

420 425 430

Asn Glu Arg Gln Ala Asn Phe Leu Gly Arg Ser Trp Pro Ser Leu Lys

435 440 445

Gly Arg Pro Gly Asn Phe Leu Gln Asn Arg Pro Glu Pro Ser Ala Pro

450 455 460

Pro Glu Glu Ser Phe Lys Phe Gly Glu Glu Thr Thr Thr Pro Pro Gln

465 470 475 480

Lys Gln Glu Pro Ile Asp Lys Asp Leu Tyr Pro Leu Ala Ser Leu Arg

485 490 495

Ser Leu Phe Gly Asn Asp Pro Ser Ser Thr

500 505

<210> 787

<211> 231

<212> PRT

<213> Artificial Sequence

<220><223> HIV B gag CEN-4 Conserved, Tailored

<400> 787

Pro Ile Val Gln Asn Met Gln Gly Gln Met Val His Gln Ala Leu Ser

1 5 10 15

Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys Ala Phe
20 25 30
Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser Glu Gly Ala Thr
35 40 45
Pro His Asp Leu Asn Thr Met Leu Asn Thr Ile Gly Gly His Gln Ala
50 55 60
Ala Met Gln Ile Leu Lys Glu Thr Ile Asn Glu Glu Ala Ala Glu Trp
65 70 75 80

Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala Pro Gly Gln Ile
85 90 95
Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Asn Leu Gln
100 105 110
Glu Gln Ile Gly Trp Met Thr His Asn Pro Pro Ile Pro Val Gly Glu
115 120 125
Ile Tyr Lys Lys Trp Ile Ile Met Gly Leu Asn Lys Ile Val Arg Met
130 135 140

Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly Pro Lys Glu Pro
145 150 155 160
Phe Arg Asp Tyr Val Asp Arg Phe Tyr Lys Thr Leu Arg Ala Glu Gln
165 170 175
Ala Thr Gln Glu Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln
180 185 190
Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro Gly
195 200 205

Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro
210 215 220
Ala His Lys Ala Arg Val Leu
225 230
<210> 788
<211> 505
<212> PRT
<213> Artificial Sequence

<220><223> HIV B gag CEN-5, Tailored

<400> 788

Met Gly Ser Arg Ala Ser Val Leu Ser Gly Gly Lys Leu Asp Lys Trp
1 5 10 15

Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys Lys Tyr Gln Leu Lys

20 25 30

His Ile Val Trp Ala Ser Arg Glu Leu Glu Arg Tyr Ala Leu Asn Pro
35 40 45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Arg Gln Ile Leu Glu Gln Leu
50 55 60

Gln Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Arg Ser Leu Tyr Asn
65 70 75 80

Thr Val Ala Val Leu Tyr Cys Val His Gln Lys Ile Glu Val Lys Asp

85 90 95

Thr Lys Glu Ala Leu Glu Lys Val Glu Glu Glu Gln Asn Lys Ser Lys
100 105 110

Lys Arg Ile Gln Gln Ala Gln Gln Ala Ala Ala Ala Asp Thr Gly Asn
115 120 125

Ser Ser Lys Val Ser Gln Asn Tyr Pro Ile Val Arg Asn Leu Gln Gly
130 135 140

Gln Met Val His Gln Pro Ile Ser Pro Arg Thr Leu Asn Ala Trp Val

145 150 155 160

Lys Val Ile Glu Glu Lys Ala Phe Ser Pro Glu Val Ile Pro Met Phe
165 170 175

Ser Ala Leu Ala Glu Gly Ala Thr Pro Gln Asp Leu Asn Leu Met Leu
180 185 190

Asn Ala Val Gly Gly His Gln Ala Ala Met Gln Met Leu Lys Asp Thr
195 200 205

Ile Asn Glu Glu Ala Ala Glu Trp Asp Arg Met His Pro Val His Ala

210 215 220

Gly Pro Val Ala Pro Gly Gln Met Arg Glu Pro Arg Gly Ser Asp Ile

225 230 235 240

Ala Gly Thr Thr Ser Asn Leu Gln Glu Gln Ile Gly Trp Met Thr Ser

245 250 255

Asn Pro Pro Ile Pro Val Gly Glu Ile Tyr Lys Arg Trp Ile Ile Met

260 265 270

Gly Leu Asn Lys Ile Val Arg Met Tyr Ser Pro Val Ser Ile Leu Asp

275 280 285

Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe

290 295 300

Tyr Arg Thr Leu Arg Ala Glu Gln Ala Ser Gln Asp Val Lys Asn Trp

305 310 315 320

Met Thr Glu Thr Leu Leu Val Gln Asn Ser Asn Pro Asp Cys Lys Thr

325 330 335

Ile Leu Lys Ala Leu Gly Pro Gly Ala Thr Leu Glu Glu Met Met Thr

340 345 350

Ala Cys Gln Gly Val Gly Gly Pro Ser His Lys Ala Arg Val Leu Ala

355 360 365

Glu Ala Met Ser Gln Val Thr Asn Ser Thr Ala Ile Met Met Gln Arg

370 375 380

Gly Asn Phe Lys Asn Gln Arg Lys Ile Val Lys Cys Phe Asn Cys Gly

385 390 395 400

Lys Glu Gly His Ile Ala Lys Asn Cys Arg Ala Pro Arg Lys Arg Gly

405 410 415

Cys Trp Lys Cys Gly Arg Glu Gly His Gln Met Lys Glu Cys Thr Glu

420 425 430

Arg Gln Val Asn Phe Leu Gly Lys Ile Trp Pro Ser Tyr Lys Gly Arg

435 440 445

Pro Gly Asn Phe Leu Gln Asn Arg Pro Glu Pro Thr Ala Pro Pro Ala

450 455 460

Pro Pro Glu Glu Ser Phe Arg Phe Gly Glu Gly Thr Thr Thr Pro Ser

465 470 475 480

Gln Lys Gln Gly Thr Ile Asp Lys Glu Leu Tyr Pro Leu Thr Ser Leu
485 490 495

Arg Ser Leu Phe Gly Asn Asp Pro Ser
500 505

<210> 789

<211> 231

<212> PRT

<213> Artificial Sequence

<220><223> HIV B gag CEN-5 Conserved, Tailored

<400> 789

Pro Ile Val Arg Asn Leu Gln Gly Gln Met Val His Gln Pro Ile Ser
1 5 10 15

Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys Ala Phe
20 25 30

Ser Pro Glu Val Ile Pro Met Phe Ser Ala Leu Ala Glu Gly Ala Thr
35 40 45

Pro Gln Asp Leu Asn Leu Met Leu Asn Ala Val Gly Gly His Gln Ala
50 55 60

Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu Ala Ala Glu Trp
65 70 75 80

Asp Arg Met His Pro Val His Ala Gly Pro Val Ala Pro Gly Gln Met
85 90 95

Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Asn Leu Gln
100 105 110

Glu Gln Ile Gly Trp Met Thr Ser Asn Pro Pro Ile Pro Val Gly Glu
115 120 125

Ile Tyr Lys Arg Trp Ile Ile Met Gly Leu Asn Lys Ile Val Arg Met
130 135 140

Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly Pro Lys Glu Pro
145 150 155 160

Phe Arg Asp Tyr Val Asp Arg Phe Tyr Arg Thr Leu Arg Ala Glu Gln
165 170 175

Ala Ser Gln Asp Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val Gln
180 185 190
Asn Ser Asn Pro Asp Cys Lys Thr Ile Leu Lys Ala Leu Gly Pro Gly
195 200 205

Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly Pro
210 215 220
Ser His Lys Ala Arg Val Leu
225 230

<210> 790
<211> 9
<212> PRT
<213> Artificial Sequence
<220><223> Toy Sequence
<400> 790
Val Thr Ser Ser Asn Met Asn Asn Ala
1 5

<210> 791
<211> 9
<212> PRT
<213> Artificial Sequence
<220><223> Toy Sequence
<400> 791
Thr Ser Ser Asn Met Asn Asn Ala Asp

1 5

<210> 792
<211> 19
<212> PRT
<213> Artificial Sequence
<220><223> Toy Sequence
<400> 792
Thr Ser Ser Asn Met Asn Asn Ala Asp Ser Val Trp Leu Arg Ala Gln
1 5 10 15
Glu Glu Glu

<210> 793

<211> 19

<212> PRT

<213> Artificial Sequence

<220><223> Toy Sequence

<400> 793

Thr Ser Ser Asn Met Asn Asn Ala Asp Cys Val Trp Leu Arg Ala Gln

1 5 10 15

Glu Glu Glu

<210> 794

<211> 7

<212> PRT

<213> Artificial Sequence

<220><223> Toy Sequence

<400> 794

Ala Arg Cys His Ser Leu Met

1 5

<210> 795

<211> 7

<212> PRT

<213> Artificial Sequence

<220><223> Toy Sequence

<400> 795

Asp Glu Phe Gly Lys Leu Met

1 5

<210> 796

<211> 12

<212> PRT

<213> Artificial Sequence

<220><223> Toy Sequence

<400> 796

Glu Pro Thr Ala Pro Pro Ala Glu Pro Thr Ala Pro

1 5 10

<210> 797

<211> 12

<212> PRT

<213> Artificial Sequence

<220><223> Toy Sequence

<400> 797

Pro Thr Ala Pro Pro Ala Glu Pro Thr Ala Pro Pro

1 5 10

<210> 798

<211> 13

<212> PRT

<213> Artificial Sequence

<220><223> Toy Sequence

<400> 798

Glu Pro Thr Ala Pro Pro Ala Glu Pro Thr Ala Pro Pro

1 5 10

<210> 799

<211> 7

<212> PRT

<

213> Artificial Sequence

<220><223> Toy Sequence

<400> 799

Ala Arg Cys Gly Ser Leu Met

1 5

<210> 800

<211> 7

<212> PRT

<213> Artificial Sequence

<220><223> Toy Sequence

<400> 800

Ala Arg Cys Gly Ser Pro Met

1 5

<210> 801

<211> 7

<212> PRT

<213> Artificial Sequence

<220><223> Toy Sequence

<400> 801

Ala Arg Tyr Gly Ser Leu Met

1 5

<210> 802

<211> 7

<212> PRT

<213> Artificial Sequence

<220><223> Toy Sequence

<400> 802

Ala Tyr Cys His Ser Leu Met

1 5

<210> 803

<211> 7

<212> PRT

<213> Artificial Sequence

<220><223> Toy Sequence

<400> 803

Tyr Arg Cys His Ser Leu Met

1 5

<210> 804

<211> 7

<212> PRT

<213> Artificial Sequence

<220><223> Toy Sequence

<400> 804

Asp Glu Phe Gly Ser Leu Met

1 5

<210> 805

<211> 7

<212> PRT

<213> Artificial Sequence

<220><223> Toy Sequence

<400> 805

Asp Glu Phe Gly Lys Leu Met

1 5

<210> 806

<211> 8

<212> PRT

<213> Artificial Sequence

<220><223> Toy Sequence

<400> 806

Ala Arg Cys Cys Asp Glu Gly His

1 5

<210> 807

<211> 8

<212> PRT

<213> Artificial Sequence

<220><223> Toy Sequence

<400> 807

Ala Arg Cys Asp Glu Phe Gly His

1 5

<210> 808

<211> 8

<212> PRT

<213> Artificial Sequence

<220><223> Toy Sequence

<400> 808

Ala Arg Cys Cys Asp Glu Gly His

1 5

<210> 809

<211> 8

<212> PRT

<213> Artificial Sequence

<220><223> Toy Sequence

<400> 809

Ala Arg Cys Asp Glu Phe Gly His

1 5