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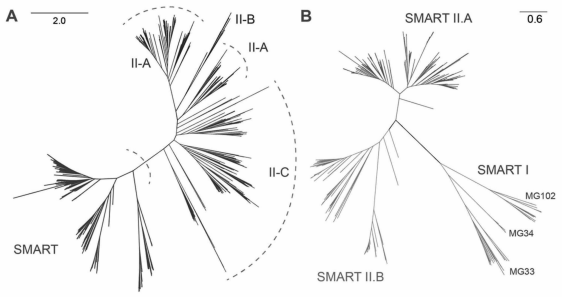
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본 개시내용은 엔도뉴클레아제 효소뿐만 아니라 이러한 효소 또는 이의 변이체를 사용하는 방법을 제공한다.

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명 세 서

청구범위

청구항 1

(a) RuvC 도메인 및 HNH 도메인을 포함하는 엔도뉴클레아제로서, 상기 엔도뉴클레아제는 배양되지 않은 미생물로부터 유래된 것인 엔도뉴클레아제; 및

(b) (i) 표적 데옥시리보핵산 서열에 혼성화하도록 구성된 가이드 리보핵산 서열; 및

(ii) 상기 엔도뉴클레아제에 결합하도록 구성된 tracr 리보핵산 서열

을 포함하는 상기 엔도뉴클레아제와 복합체를 형성하도록 구성된 조작된 가이드 리보핵산 구조체

를 포함하는 조작된 뉴클레아제 시스템으로서,

상기 엔도뉴클레아제는 약 96 kDa 이하의 분자량을 갖는 것인 조작된 뉴클레아제 시스템.

청구항 2

제1항에 있어서, 상기 엔도뉴클레아제는 고세균 엔도뉴클레아제인 조작된 뉴클레아제 시스템.

청구항 3

제1항 또는 제2항에 있어서, 상기 엔도뉴클레아제는 클래스 2, 유형 II Cas 엔도뉴클레아제인 조작된 뉴클레아제 시스템.

청구항 4

제1항 내지 제3항 중 어느 한 항에 있어서, 상기 엔도뉴클레아제는 서열번호: 1-198, 221-459, 463-612, 또는 617-668 중 어느 하나에 대해 적어도 70%, 적어도 75%, 적어도 80% 또는 적어도 90% 서열 동일성을 갖는 서열을 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 5

제1항 내지 제4항 중 어느 한 항에 있어서, 상기 엔도뉴클레아제는 RRxRR 모티프를 포함하는 아르기닌 풍부 영역 또는 PF14239 상동성을 갖는 도메인을 추가로 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 6

제5항에 있어서, 상기 아르기닌 풍부 영역 또는 상기 PF14239 상동성을 갖는 도메인은 서열번호: 1-198, 221-459, 463-612, 또는 617-668 중 어느 하나의 상기 아르기닌 풍부 영역 또는 상기 PF14239 상동성을 갖는 도메인에 대해 적어도 85%, 적어도 90%, 또는 적어도 95% 동일성을 갖는 것인 조작된 뉴클레아제 시스템.

청구항 7

제1항 내지 제6항 중 어느 한 항에 있어서, 상기 엔도뉴클레아제는 REC(인식) 도메인을 추가로 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 8

제7항에 있어서, 상기 REC 도메인은 서열번호: 1-198, 221-459, 463-612, 또는 617-668 중 어느 하나의 REC 도메인에 대해 적어도 85%, 적어도 90%, 또는 적어도 95% 동일성을 갖는 것인 조작된 뉴클레아제 시스템.

청구항 9

제1항 내지 제8항 중 어느 한 항에 있어서, 상기 엔도뉴클레아제는 BH(브릿지 나선) 도메인, WED(웨지) 도메인, 및 PI(PAM 상호작용) 도메인을 추가로 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 10

제9항에 있어서, 상기 BH 도메인, 상기 WED 도메인, 또는 상기 PI 도메인은 서열번호: 1-198, 221-459, 463-612, 또는 617-668 중 어느 하나의 BH 도메인, WED 도메인, 및/또는 PI 도메인에 대해 적어도 85%, 적어도 90%, 또는 적어도 95% 동일성을 갖는 것인 조작된 뉴클레아제 시스템.

청구항 11

(a) RuvC-I 도메인 및 HNH 도메인을 포함하는 엔도뉴클레아제; 및

(b) (i) 표적 데옥시리보핵산 서열에 혼성화하도록 구성된 가이드 리보핵산 서열; 및

(ii) 상기 엔도뉴클레아제에 결합하도록 구성된 리보핵산 서열

을 포함하는 상기 엔도뉴클레아제와 복합체를 형성하도록 구성된 조작된 가이드 리보핵산 구조체

를 포함하는 조작된 뉴클레아제 시스템으로서,

상기 엔도뉴클레아제는 서열번호: 1-198, 221-459, 463-612, 또는 617-668 중 어느 하나에 대해 적어도 70%, 적어도 75%, 적어도 80% 또는 적어도 90% 서열 동일성을 갖는 서열을 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 12

제11항에 있어서, 상기 엔도뉴클레아제는 고세균 엔도뉴클레아제인 조작된 뉴클레아제 시스템.

청구항 13

제11항 또는 제12항에 있어서, 상기 엔도뉴클레아제는 클래스 2, 유형 II Cas 엔도뉴클레아제인 조작된 뉴클레아제 시스템.

청구항 14

제11항 내지 제13항 중 어느 한 항에 있어서, 상기 엔도뉴클레아제는 RRxRR 모티프를 포함하는 아르기닌 풍부 영역 또는 PF14239 상동성을 갖는 도메인을 추가로 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 15

제14항에 있어서, 상기 아르기닌 풍부 영역 또는 상기 PF14239 상동성을 갖는 도메인은 서열번호: 1-198, 221-459, 463-612, 또는 617-668 중 어느 하나의 아르기닌 풍부 영역에 대해 적어도 85%, 적어도 90%, 또는 적어도 95% 동일성을 갖는 것인 조작된 뉴클레아제 시스템.

청구항 16

제11항 내지 제15항 중 어느 한 항에 있어서, 상기 엔도뉴클레아제는 REC(인식) 도메인을 추가로 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 17

제16항에 있어서, 상기 REC 도메인은 서열번호: 1-198, 221-459, 463-612, 또는 617-668 중 어느 하나의 REC 도메인에 대해 적어도 85%, 적어도 90%, 또는 적어도 95% 동일성을 갖는 것인 조작된 뉴클레아제 시스템.

청구항 18

제11항 내지 제17항 중 어느 한 항에 있어서, 상기 엔도뉴클레아제는 BH 도메인, WED 도메인, 및 PI 도메인을 추가로 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 19

제18항에 있어서, 상기 BH 도메인, 상기 WED 도메인, 또는 상기 PI 도메인은 서열번호: 1-198, 221-459, 463-612, 또는 617-668 중 어느 하나의 BH 도메인, WED 도메인, 및/또는 PI 도메인에 대해 적어도 85%, 적어도 90%, 또는 적어도 95% 동일성을 갖는 것인 조작된 뉴클레아제 시스템.

청구항 20

제11항 내지 제19항 중 어느 한 항에 있어서, 상기 엔도뉴클레아제는 배양되지 않은 미생물로부터 유래된 것인 조작된 뉴클레아제 시스템.

청구항 21

제1항 내지 제20항 중 어느 한 항에 있어서, 상기 엔도뉴클레아제에 결합하도록 구성된 상기 리보핵산 서열은 서열번호: 199-200, 460-461, 또는 669-673 중 어느 하나에 대해 적어도 80% 서열 동일성을 갖는 서열, 또는 서열번호: 201-203 또는 613-616 중 어느 하나의 비축퇴성 뉴클레오타이드에 대해 적어도 80% 서열 동일성을 갖는 서열을 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 22

제21항에 있어서, 상기 가이드 핵산 구조체는 서열번호: 201-203, 613-616 중 어느 하나의 비축퇴성 뉴클레오타이드에 대해 적어도 80% 동일성을 갖는 서열을 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 23

(c) (i) 표적 데옥시리보핵산 서열에 혼성화하도록 구성된 가이드 리보핵산 서열; 및

(ii) 엔도뉴클레아제에 결합하도록 구성된 리보핵산 서열로서, 상기 리보핵산 서열은 서열번호: 199-200, 460-461, 또는 669-673 중 어느 하나에 대해 적어도 80% 서열 동일성을 갖는 서열, 또는 서열번호: 201-203 또는 613-616 중 어느 하나의 비가변 뉴클레오타이드에 대해 적어도 80% 서열 동일성을 갖는 서열을 포함하는 것인 리보핵산 서열

을 포함하는 조작된 가이드 리보핵산 구조체; 및

(d) 상기 조작된 가이드 리보핵산에 결합하도록 구성된 RNA 가이드된 엔도뉴클레아제

를 포함하는 조작된 뉴클레아제 시스템.

청구항 24

제23항에 있어서, 상기 RNA 가이드된 엔도뉴클레아제는 고세균 엔도뉴클레아제인 조작된 뉴클레아제 시스템.

청구항 25

제23항 또는 제24항에 있어서, 상기 엔도뉴클레아제는 약 120 kDa 이하, 100 kDa 이하, 90 kDa 이하, 또는 60 kDa 이하의 분자량을 갖는 것인 조작된 뉴클레아제 시스템.

청구항 26

제1항 내지 제25항 중 어느 한 항에 있어서, 상기 조작된 가이드 리보핵산 구조체는 적어도 2개의 리보핵산 폴리뉴클레오타이드를 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 27

제1항 내지 제26항 중 어느 한 항에 있어서, 상기 조작된 가이드 리보핵산 구조체는 상기 가이드 리보핵산 서열 및 상기 tracr 리보핵산 서열을 포함하는 단일 리보핵산 폴리뉴클레오타이드를 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 28

제1항 내지 제27항 중 어느 한 항에 있어서, 상기 가이드 리보핵산 서열은 원핵생물, 박테리아, 고세균, 진핵생물, 진균, 식물, 포유동물, 또는 인간 게놈 서열에 상보적인 조작된 뉴클레아제 시스템.

청구항 29

제1항 내지 제28항 중 어느 한 항에 있어서, 상기 가이드 리보핵산 서열은 15-24개 뉴클레오타이드 길이인 조작된 뉴클레아제 시스템.

청구항 30

제1항 내지 제29항 중 어느 한 항에 있어서, 상기 엔도뉴클레아제는 상기 엔도뉴클레아제의 N- 또는 C-말단에 근접한 하나 이상의 핵 위치화 서열(NLS)을 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 31

제1항 내지 제30항 중 어느 한 항에 있어서, 상기 NLS는 서열번호: 205-220으로부터 선택된 서열을 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 32

제1항 내지 제31항 중 어느 한 항에 있어서, 5'부터 3'까지 상기 표적 데옥시리보핵산 서열의 5'에 적어도 20개의 뉴클레오타이드의 서열을 포함하는 제1 상동성 암(arm), 적어도 10개의 뉴클레오타이드의 합성 DNA 서열, 및 상기 표적 서열의 3'에 적어도 20개의 뉴클레오타이드의 서열을 포함하는 제2 상동성 암을 포함하는 단일 또는 이중 가닥 DNA 복구 주형을 추가로 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 33

제32항에 있어서, 상기 제1 또는 제2 상동성 암은 적어도 40, 80, 120, 150, 200, 300, 500, 또는 1,000개의 뉴클레오타이드의 서열을 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 34

제1항 내지 제33항 중 어느 한 항에 있어서, 상기 시스템은 Mg^{2+}의 공급원을 추가로 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 35

제1항 내지 제34항 중 어느 한 항에 있어서, 상기 엔도뉴클레아제 및 상기 tracr 리보핵산 서열은 동일한 문(phylum) 내의 별개의 박테리아 종으로부터 유래된 것인 조작된 뉴클레아제 시스템.

청구항 36

제1항 내지 제35항 중 어느 한 항에 있어서, 상기 엔도뉴클레아제는 서열번호: 2-24 중 어느 하나에 대해 적어도 70% 서열 동일성을 갖는 서열을 포함하고, 상기 가이드 RNA 구조체는 스템 및 루프를 포함하는 헤어핀을 포함할 것으로 예측된 RNA 서열을 포함하고, 상기 스템은 적어도 12쌍의 리보뉴클레오타이드를 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 37

제36항에 있어서, 상기 가이드 RNA 구조체는 제2 스템 및 제2 루프를 추가로 포함하고, 제2 스템은 적어도 5쌍의 리보뉴클레오타이드를 포함하는 것인 조작된 엔도뉴클레아제 시스템.

청구항 38

제36항에 있어서, 상기 가이드 RNA 구조체는 적어도 2개의 헤어핀을 포함하는 RNA 구조체를 추가로 포함하는 것인 조작된 엔도뉴클레아제 시스템.

청구항 39

제1항 내지 제38항 중 어느 한 항에 있어서, 상기 엔도뉴클레아제는 서열번호: 1에 대해 적어도 70% 서열 동일성을 갖는 서열을 포함하고, 상기 가이드 RNA 구조체는 스템 및 루프를 포함하는 적어도 4개의 헤어핀을 포함할 것으로 예측된 RNA 서열을 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 40

제1항 내지 제39항 중 어느 한 항에 있어서,

a) 상기 엔도뉴클레아제는 서열번호: 1, 2, 10, 17, 또는 613-616 중 어느 하나에 대해 적어도 70%, 적어도

80%, 또는 적어도 90% 동일한 서열을 포함하고;

b) 상기 가이드 RNA 구조체는 서열번호: 199-200 또는 669-673 중 어느 하나 또는 서열번호: 201-203 또는 613-616 중 어느 하나의 비가변 뉴클레오타이드에 대해 적어도 70%, 적어도 80%, 또는 적어도 90% 동일한 서열을 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 41

제1항 내지 제39항 중 어느 한 항에 있어서,

a) 상기 엔도뉴클레아제는 서열번호: 1-24, 462-488, 또는 501-612 중 어느 하나에 대해 적어도 70%, 적어도 80%, 또는 적어도 90% 동일한 서열을 포함하고;

b) 상기 가이드 RNA 구조체는 서열번호: 199-200 또는 669-673 중 어느 하나 또는 서열번호: 201-203 또는 613-616 중 어느 하나의 비가변 뉴클레오타이드에 대해 적어도 70%, 적어도 80%, 또는 적어도 90% 동일한 서열을 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 42

제1항 내지 제39항 중 어느 한 항에 있어서,

a) 상기 엔도뉴클레아제는 서열번호 2, 10, 또는 17 중 어느 하나에 대해 적어도 70%, 적어도 80%, 또는 적어도 90% 동일한 서열을 포함하고;

b) 상기 가이드 RNA 구조체는 서열번호: 202-203 또는 613-614 중 어느 하나의 비가변 뉴클레오타이드에 대해 적어도 70%, 적어도 80%, 또는 적어도 90% 동일한 서열을 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 43

제1항 내지 제39항 중 어느 한 항에 있어서,

a) 상기 엔도뉴클레아제는 서열번호: 25-198, 221-459, 또는 489-580 중 어느 하나에 대해 적어도 70%, 적어도 80%, 또는 적어도 90% 동일한 서열을 포함하고;

b) 상기 가이드 RNA 구조체는 클래스 2, 유형 II sgRNA 또는 tracr 서열에 대해 적어도 70%, 적어도 80%, 또는 적어도 90% 동일한 서열을 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 44

제1항 내지 제43항 중 어느 한 항에 있어서, 상기 서열 동일성은 BLASTP, CLUSTALW, MUSCLE, MAFFT, 또는 스미스-워터맨(Smith-Waterman) 상동성 검색 알고리즘의 파라미터를 갖는 CLUSTALW에 의해 결정되는 것인 조작된 뉴클레아제 시스템.

청구항 45

제44항에 있어서, 상기 서열 동일성은 3의 단어길이(W), 10의 기대값(E), 및 11의 존재, 1의 확장에서 갭 비용을 설정하는 BLOSUM62 스코어링 매트릭스의 파라미터를 사용하고 조건부 구성 스코어 매트릭스 조정을 사용하는 상기 BLASTP 상동성 검색 알고리즘에 의해 결정되는 것인 조작된 뉴클레아제 시스템.

청구항 46

제1항 내지 제45항 중 어느 한 항에 있어서, 상기 엔도뉴클레아제는 Cas9 엔도뉴클레아제, Cas14 엔도뉴클레아제, Cas12a 엔도뉴클레아제, Cas12b 엔도뉴클레아제, Cas12c 엔도뉴클레아제, Cas12d 엔도뉴클레아제, Cas12e 엔도뉴클레아제, Cas13a 엔도뉴클레아제, Cas13b 엔도뉴클레아제, Cas13c 엔도뉴클레아제, 또는 Cas13d 엔도뉴클레아제가 아닌 것인 조작된 뉴클레아제 시스템.

청구항 47

제46항에 있어서, 상기 엔도뉴클레아제는 Cas9 엔도뉴클레아제에 대해 80% 미만의 동일성을 갖는 것인 조작된 뉴클레아제 시스템.

청구항 48

a) 표적 DNA 분자 내의 표적 서열에 상보적인 뉴클레오타이드 서열을 포함하는 DNA 표적화 분절; 및

b) 혼성화하여 이중 가닥 RNA(dsRNA) 듀플렉스를 형성하는 뉴클레오타이드의 2개의 상보적 스트레치를 포함하는 단백질 결합 분절

을 포함하는 조작된 단일 가이드 리보핵산 폴리뉴클레오타이드로서,

상기 뉴클레오타이드의 2개의 상보적 스트레치는 개재하는 뉴클레오타이드와 서로 공유적으로 연결되고,

상기 조작된 가이드 리보핵산 폴리뉴클레오타이드는 서열번호: 1-198, 221-459, 463-612 또는 617-668 중 어느 하나에 대해 적어도 75% 서열 동일성을 갖는 변이체를 포함하는 엔도뉴클레아제와 복합체를 형성하도록 구성된 것인 조작된 단일 가이드 리보핵산 폴리뉴클레오타이드.

청구항 49

제48항에 있어서, 상기 DNA 표적화 분절은 상기 뉴클레오타이드의 2개의 상보적 스트레치의 둘 모두의 5'에 위치하는 것인 조작된 가이드 리보핵산 폴리뉴클레오타이드.

청구항 50

제48항 또는 제49항에 있어서,

a) 상기 단백질 결합 분절은 서열번호: 199-200 또는 669-673 중 어느 하나에 대해 적어도 70%, 적어도 80%, 또는 적어도 90% 동일한 서열을 포함하고;

b) 상기 단백질 결합 분절은 서열번호: 201-203 또는 613-616 중 어느 하나의 비가변 뉴클레오타이드에 대해 적어도 70%, 적어도 80%, 또는 적어도 90% 동일한 서열을 포함하는 것인 조작된 가이드 리보핵산 폴리뉴클레오타이드.

청구항 51

제48항 또는 제49항에 있어서,

a) 상기 엔도뉴클레아제는 서열번호 2, 10, 또는 17 중 어느 하나에 대해 적어도 70%, 적어도 80%, 또는 적어도 90% 동일한 서열을 포함하고;

b) 상기 가이드 RNA 구조체는 서열번호: 200 또는 서열번호: 202-203 또는 613-614의 비가변 뉴클레오타이드 중 적어도 하나에 대해 적어도 70%, 적어도 80%, 또는 적어도 90% 동일한 서열을 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 52

제48항 또는 제49항에 있어서,

a) 상기 엔도뉴클레아제는 서열번호: 25-198, 221-459, 또는 489-580 중 어느 하나에 대해 적어도 70%, 적어도 80%, 또는 적어도 90% 동일한 서열을 포함하고;

b) 상기 가이드 RNA 구조체는 클래스 2, 유형 II sgRNA에 대해 적어도 70%, 적어도 80%, 또는 적어도 90% 동일한 서열을 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 53

제1항 내지 제52항 중 어느 한 항에 있어서, 상기 엔도뉴클레아제는 상기 엔도뉴클레아제에 결합된 염기 에디터 또는 히스톤 에디터를 추가로 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 54

제53항에 있어서, 상기 염기 에디터는 아데노신 데아미나제인 조작된 뉴클레아제 시스템.

청구항 55

제54항에 있어서, 상기 아데노신 데아미나제는 ADAR1 또는 ADAR2를 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 56

제53항에 있어서, 상기 염기 에디터는 시토신 데아미나제인 조작된 뉴클레아제 시스템.

청구항 57

제56항에 있어서, 상기 시토신 데아미나제는 APOBEC1, APOBEC2, APOBEC3A, APOBEC3B, APOBEC3C, APOBEC3D, APOBEC3F, APOBEC3G, APOBEC3H, 또는 APOBEC4를 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 58

제48항 내지 제57항 중 어느 한 항의 조작된 가이드 리보핵산 폴리뉴클레오타이드를 코딩하는 데옥시리보핵산 폴리뉴클레오타이드.

청구항 59

유기체에서의 발현을 위해 최적화된 조작된 핵산 서열을 포함하는 핵산으로서, 상기 핵산은 RuvC 도메인 및 HNH 도메인을 포함하는 클래스 2, 유형 II Cas 엔도뉴클레아제를 코딩하고, 상기 엔도뉴클레아제는 배양되지 않은 미생물로부터 유래되며, 상기 엔도뉴클레아제는 약 120 kDa 이하, 100 kDa 이하, 90 kDa 이하, 60 kDa 이하, 또는 30 kDa 이하의 분자량을 갖는 것인 핵산.

청구항 60

제59항에 있어서, 상기 엔도뉴클레아제는 서열번호: 1-198, 221-459, 463-612, 또는 617-668 또는 그에 대해 적어도 70% 서열 동일성을 갖는 이의 변이체를 포함하는 것인 핵산.

청구항 61

제59항 또는 제60항에 있어서, 상기 엔도뉴클레아제는 상기 엔도뉴클레아제의 N- 또는 C-말단에 근접한 하나 이상의 핵 위치화 서열(NLS)을 코딩하는 서열을 추가로 포함하는 것인 핵산.

청구항 62

제61항에 있어서, 상기 NLS는 서열번호: 205-220으로부터 선택된 서열을 포함하는 것인 핵산.

청구항 63

제59항 내지 제62항 중 어느 한 항에 있어서, 상기 유기체는 원핵생물, 박테리아, 진핵생물, 진균, 식물, 포유동물, 설치류, 또는 인간인 핵산.

청구항 64

제63항에 있어서, 상기 유기체는 원핵생물 또는 박테리아이고, 상기 유기체는 상기 엔도뉴클레아제가 유래된 유기체와 상이한 유기체인 핵산.

청구항 65

제63항에 있어서, 상기 유기체는 상기 배양되지 않은 미생물이 아닌 것인 핵산.

청구항 66

RuvC-I 도메인 및 HNH 도메인을 포함하는 RNA 가이드된 엔도뉴클레아제를 코딩하는 핵산 서열을 포함하는 벡터로서, 상기 엔도뉴클레아제는 배양되지 않은 미생물로부터 유래되고, 상기 엔도뉴클레아제는 약 120 kDa 이하, 100kDa 이하, 90 kDa 이하, 또는 60 kDa 이하의 분자량을 가지며, RNA 가이드된 엔도뉴클레아제는 선택적으로 고세균성인 벡터.

청구항 67

제66항에 있어서, 상기 엔도뉴클레아제는 RRxRR 모티프를 포함하는 아르기닌 풍부 영역 또는 PF14239 상동성을

갖는 도메인을 추가로 포함하는 것인 벡터.

청구항 68

제66항 또는 제67항에 있어서, 상기 엔도뉴클레아제는 REC(인식) 도메인을 추가로 포함하는 것인 벡터.

청구항 69

제67항 또는 제68항에 있어서, 상기 엔도뉴클레아제는 BH 도메인, WED 도메인, 및 PI 도메인을 추가로 포함하는 것인 벡터.

청구항 70

제59항 내지 제69항 중 어느 한 항의 핵산을 포함하는 벡터.

청구항 71

제67항 내지 제70항 중 어느 한 항에 있어서, 상기 엔도뉴클레아제와 복합체를 형성하도록 구성된 조작된 가이드 리보핵산 구조체를 코딩하는 핵산을 추가로 포함하며, 상기 조작된 가이드 리보핵산 구조체는:

a) 표적 데옥시리보핵산 서열에 혼성화하도록 구성된 가이드 리보핵산 서열; 및

b) 상기 엔도뉴클레아제에 결합하도록 구성된 tracr 리보핵산 서열을 포함하는 것인 벡터.

청구항 72

제66항 내지 제71항 중 어느 한 항에 있어서, 벡터는 플라스미드, 미니서클, CELiD, 아데노 연관 바이러스(AAV) 유래 비리온, 또는 렌티바이러스인 벡터.

청구항 73

제66항 내지 제72항 중 어느 한 항의 벡터를 포함하는 세포.

청구항 74

제73항에 있어서, 상기 세포는 박테리아, 고세균, 진균, 진핵생물, 포유동물, 또는 식물 세포인 세포.

청구항 75

제74항에 있어서, 상기 세포는 박테리아 세포인 세포.

청구항 76

제73항 내지 제75항 중 어느 한 항의 상기 세포를 배양하는 단계를 포함하는, 엔도뉴클레아제를 제조하는 방법.

청구항 77

이중 가닥 데옥시리보핵산 폴리뉴클레오타이드를 결합, 절단, 마킹 또는 변형시키는 방법으로서,

(e) 상기 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드를, 클래스 2, 유형 II Cas 엔도뉴클레아제 및 상기 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드에 결합하도록 구성된 조작된 가이드 리보핵산 구조체와 복합된 상기 엔도뉴클레아제와 접촉시키는 단계를 포함하고;

(f) 상기 이중가닥 데옥시리보핵산 폴리뉴클레오타이드는 프로토스페이서 인접 모티프(PAM)를 포함하며;

상기 엔도뉴클레아제는 약 120 kDa 이하, 100 kDa 이하, 90 kDa 이하, 또는 60 kDa 이하의 분자량을 갖는 것인 방법.

청구항 78

제77항에 있어서, 상기 엔도뉴클레아제는 상기 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드를 절단하고, 상기 PAM은 NGG를 포함하는 것인 방법.

청구항 79

제77항 또는 제78항에 있어서, 상기 엔도뉴클레아제는 상기 PAM으로부터 6-8개 뉴클레오타이드 또는 7개 뉴클레오타이드에서 상기 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드를 절단하는 것인 방법.

청구항 80

제77항에 있어서, 상기 엔도뉴클레아제는 서열번호: 1-198, 221-459, 463-612, 또는 617-668 중 어느 하나에 대해 적어도 70%, 적어도 75%, 적어도 80% 또는 적어도 90% 서열 동일성을 갖는 변이체를 포함하는 것인 방법.

청구항 81

이중 가닥 데옥시리보핵산 폴리뉴클레오타이드를 결합, 절단, 마킹 또는 변형시키는 방법으로서,

(g) 상기 이중가닥 데옥시리보핵산 폴리뉴클레오타이드를, RNA 가이드된 고세균 엔도뉴클레아제 및 상기 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드에 결합하도록 구성된 조작된 가이드 리보핵산 구조체와 복합된 상기 엔도뉴클레아제와 접촉시키는 단계를 포함하고;

(h) 상기 이중가닥 데옥시리보핵산 폴리뉴클레오타이드는 프로토스페이서 인접 모티프(PAM)를 포함하며;

상기 엔도뉴클레아제는 서열번호: 1-198, 221-459, 463-612, 또는 617-668 중 어느 하나에 대해 적어도 70%, 적어도 75%, 적어도 80% 또는 적어도 90% 서열 동일성을 갖는 변이체를 포함하는 것인 방법.

청구항 82

제81항에 있어서, 상기 엔도뉴클레아제는 상기 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드를 절단하고, 상기 PAM은 NGG를 포함하는 것인 방법.

청구항 83

제81항 또는 제82항에 있어서, 상기 엔도뉴클레아제는 상기 PAM으로부터 6-8 또는 7개 뉴클레오타이드에서 상기 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드를 절단하는 것인 방법.

청구항 84

제77항 내지 제83항 중 어느 한 항에 있어서, 상기 클래스 2, 유형 II Cas 엔도뉴클레아제는 Cas9 엔도뉴클레아제, Cas14 엔도뉴클레아제, Cas12a 엔도뉴클레아제, Cas12b 엔도뉴클레아제, Cas12c 엔도뉴클레아제, Cas12d 엔도뉴클레아제, Cas12e 엔도뉴클레아제, Cas13a 엔도뉴클레아제, Cas13b 엔도뉴클레아제, Cas13c 엔도뉴클레아제, 또는 Cas13d 엔도뉴클레아제가 아닌 것인 방법.

청구항 85

제77항 내지 제84항 중 어느 한 항에 있어서, 상기 클래스 2, 유형 II Cas 엔도뉴클레아제는 배양되지 않은 미생물로부터 유래된 것인 방법.

청구항 86

제77항 내지 제85항 중 어느 한 항에 있어서, 상기 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드는 원핵생물, 고세균, 박테리아, 진핵생물, 식물, 진균, 포유동물, 설치류, 또는 인간 이중가닥 데옥시리보핵산 폴리뉴클레오타이드인 방법.

청구항 87

제86항에 있어서, 상기 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드는 상기 엔도뉴클레아제가 유래된 종 이외의 종으로부터의 원핵생물, 고세균, 또는 박테리아 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드인 방법.

청구항 88

표적 핵산 유전자좌를 변형시키는 방법으로서, 제1항 내지 제47항 중 어느 한 항의 상기 조작된 뉴클레아제 시스템을 상기 표적 핵산 유전자좌에 전달하는 단계를 포함하고, 상기 엔도뉴클레아제는 상기 조작된 가이드 리보핵산 구조체와 복합체를 형성하도록 구성되며, 상기 복합체는 상기 표적 핵산 유전자좌에 대한 상기 복합체의

결합시, 상기 복합체가 상기 표적 핵산 유전자좌를 변형시키도록 구성되는 것인 방법.

청구항 89

제88항에 있어서, 상기 표적 핵산 유전자좌를 변형시키는 것은 상기 표적 핵산 유전자좌를 결합, 니킹, 절단, 또는 마킹하는 것을 포함하는 것인 방법.

청구항 90

제88항 또는 제89항에 있어서, 상기 표적 핵산 유전자좌는 데옥시리보핵산(DNA) 또는 리보핵산(RNA)을 포함하는 것인 방법.

청구항 91

제90항에 있어서, 상기 표적 핵산은 게놈 진핵 DNA, 고세균 DNA, 바이러스 DNA, 또는 박테리아 DNA를 포함하는 것인 방법.

청구항 92

제91항에 있어서, 상기 표적 핵산은 박테리아 DNA를 포함하며, 상기 박테리아 DNA는 상기 엔도뉴클레아제가 유래된 종과 상이한 박테리아 또는 고세균 종으로부터 유래된 것인 방법.

청구항 93

제88항 내지 제92항 중 어느 한 항에 있어서, 상기 표적 핵산 유전자좌는 시험관 내에 있는 것인 방법.

청구항 94

제88항 내지 제92항 중 어느 한 항에 있어서, 상기 표적 핵산 유전자좌는 세포 내에 있는 것인 방법.

청구항 95

제94항에 있어서, 상기 엔도뉴클레아제 및 상기 조작된 가이드 핵산 구조체는 별개의 핵산 분자에 의해 코딩된 것인 방법.

청구항 96

제94항 또는 제95항에 있어서, 상기 세포는 원핵 세포, 박테리아 세포, 고세균 세포, 진핵 세포, 진균 세포, 식물 세포, 동물 세포, 포유동물 세포, 설치류 세포, 영장류 세포, 또는 인간 세포인 방법.

청구항 97

제94항 또는 제95항에 있어서, 상기 세포는 상기 엔도뉴클레아제가 유래된 종과 상이한 종으로부터 유래된 것인 방법.

청구항 98

제94항 내지 제97항 중 어느 한 항에 있어서, 상기 조작된 뉴클레아제 시스템을 상기 표적 핵산 유전자좌에 전달하는 것은 제59항 내지 제64항 중 어느 한 항의 핵산 또는 제65항 내지 제72항 중 어느 한 항의 벡터를 전달하는 것을 포함하는 것인 방법.

청구항 99

제88항 내지 제98항 중 어느 한 항에 있어서, 상기 조작된 뉴클레아제 시스템을 상기 표적 핵산 유전자좌에 전달하는 것은 상기 엔도뉴클레아제를 코딩하는 오픈 리딩 프레임을 포함하는 핵산을 전달하는 것을 포함하는 것인 방법.

청구항 100

제99항에 있어서, 상기 핵산은 상기 엔도뉴클레아제를 코딩하는 상기 오픈 리딩 프레임이 작동가능하게 연결된 프로모터를 포함하는 것인 방법.

청구항 101

제97항 내지 제100항 중 어느 한 항에 있어서, 상기 조작된 뉴클레아제 시스템을 상기 표적 핵산 유전자좌에 전달하는 것은 상기 엔도뉴클레아제를 코딩하는 상기 오픈 리딩 프레임을 함유하는 캡핑된 mRNA를 전달하는 것을 포함하는 것인 방법.

청구항 102

제88항 내지 제95항 중 어느 한 항에 있어서, 상기 조작된 뉴클레아제 시스템을 상기 표적 핵산 유전자좌에 전달하는 것은 번역된 폴리펩타이드를 전달하는 것을 포함하는 것인 방법.

청구항 103

제88항 내지 제101항 중 어느 한 항에 있어서, 상기 조작된 뉴클레아제 시스템을 상기 표적 핵산 유전자좌에 전달하는 것은 리보핵산(RNA) pol III 프로모터에 작동가능하게 연결된 상기 조작된 가이드 리보핵산 구조체를 코딩하는 데옥시리보핵산(DNA)을 전달하는 것을 포함하는 것인 방법.

청구항 104

제88항 내지 제103항 중 어느 한 항에 있어서, 상기 엔도뉴클레아제는 상기 표적 유전자좌에서 또는 그 근위에서 단일 가닥 파단 또는 이중 가닥 파단을 유도하는 것인 방법.

청구항 105

제104항에 있어서, 상기 엔도뉴클레아제는 프로토스페이서 인접 모티프(PAM)로부터 5'에서 상기 표적 유전자좌의 근위에서 이중 가닥 파단을 유도하는 것인 방법.

청구항 106

제105항에 있어서, 상기 엔도뉴클레아제는 상기 PAM으로부터 5'의 6-8개 뉴클레오타이드 또는 7개 뉴클레오타이드에서 이중 가닥 파단을 유도하는 것인 방법.

청구항 107

제88항 내지 제103항 중 어느 한 항에 있어서, 상기 조작된 뉴클레아제 시스템은 상기 표적 유전자좌 내 또는 근위에서 뉴클레오타이드 염기의 화학적 변형을 유도하는 것인 방법.

청구항 108

제107항에 있어서, 상기 화학적 변형은 아데노신 또는 시토신 뉴클레오타이드의 탈아민화인 방법.

청구항 109

제88항 내지 제103항 중 어느 한 항에 있어서, 상기 엔도뉴클레아제는 상기 엔도뉴클레아제에 결합된 염기 에디터를 추가로 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 110

제109항에 있어서, 상기 염기 에디터는 아데노신 데아미나제인 조작된 뉴클레아제 시스템.

청구항 111

제110항에 있어서, 상기 아데노신 데아미나제는 ADAR1 또는 ADAR2를 포함하는 것인 조작된 뉴클레아제 시스템.

청구항 112

제109항에 있어서, 상기 염기 에디터는 시토신 데아미나제인 조작된 뉴클레아제 시스템.

청구항 113

제112항에 있어서, 상기 시토신 데아미나제는 APOBEC1, APOBEC2, APOBEC3A, APOBEC3B, APOBEC3C, APOBEC3D,

APOBEC3F, APOBEC3G, APOBEC3H, 또는 APOBEC4를 포함하는 것인 조작된 뉴클레아제 시스템.

발명의 설명

기 술 분 야

[0001] 상호 참조

[0002] 본 출원은 2020년 11월 19일에 출원된 "클래스 II, 유형 II CRISPR 시스템"이라는 제목의 미국 가출원 제63/116,149호, 및 2020년 3월 31일에 출원된 "클래스 II, 유형 II CRISPR 시스템"이라는 제목의 미국 가출원 제63/003,159호의 이익을 주장하며, 이들 모두는 그 전체가 본원에 포함된다.

[0003] 서열 목록

[0004] 본 출원은 ASCII 형식으로 전자적으로 제출된 서열 목록을 포함하며 이는 그 전체가 참조로 본원에 포함된다. 2021년 3월 27일에 생성된 상기 ASCII 사본의 이름은 55921-711_601_SL.txt이고 크기는 2,235,526바이트이다.

배 경 기 술

[0005] Cas 효소는 그들의 관련된 CRISPR(Clustered Regularly Interspaced Short Palindromic Repeats) 가이드 리보핵산(RNA)과 함께 원핵 면역 체계의 만연한(박테리아의 ~45%, 고세균의 ~84%) 구성요소인 것으로 보이며, CRISPR-RNA 가이드된 핵산 절단에 의해 감염성 바이러스 및 플라스미드와 같은 비자기 핵산으로부터 이러한 미생물을 보호하는 역할을 한다. CRISPR RNA 요소를 코딩하는 데옥시리보핵산(DNA) 요소는 구조와 길이가 상대적으로 보존될 수 있지만, 이들의 CRISPR 관련(Cas) 단백질은 매우 다양하며 다양한 핵산 상호작용 도메인을 포함한다. CRISPR DNA 요소는 이미 1987년에 관찰되었지만 CRISPR/Cas 복합체의 프로그래밍 가능한 엔도뉴클레아제 절단 능력은 비교적 최근에야 인식되어 다양한 DNA 조작 및 유전자 에디팅 응용 분야에서 재조합 CRISPR/Cas 시스템을 사용하게 되었다. 이들 효소의 유용성으로 인해, 이들은 다양한 생명 공학, 유전자 에디팅 및 치료 응용 분야로 용도가 변경되고 있다. 이들의 단일 효과기 아키텍처로 인해, 현재 게놈 공학용으로 용도가 변경되고 있는 대부분의 시스템은 CRISPR 클래스 2, 유형 II 및 클래스 2, 유형 V 범주에 속한다.

발명의 내용

[0006] 많은 클래스 2 Cas 효과기의 큰 크기(약 1200개 아미노산 초과)는 치료 응용 분야를 위한 전달을 어렵게 만든다. 따라서, SMART(SMall ARchaeal-associaTed) 뉴클레아제 시스템으로 지칭되는 신규한 추정되는 가이드된 dsDNA 뉴클레아제와 관련된 방법, 조성물 및 시스템이 본원에 기재된다. 이들 엔도뉴클레아제 효과기는 그들의 작은 크기(400 aa - 1050 aa), RuvC 및 HNH 촉매 도메인의 존재, 및 신규한 생화학적 메커니즘을 함께 제안하는 다른 예측된 단백질 특징들에 의해 정의된다.

[0007] 일부 양태에서, 본 개시내용은 (a) RuvC 도메인 및 HNH 도메인을 포함하는 엔도뉴클레아제로서, 상기 엔도뉴클레아제는 배양되지 않은 미생물로부터 유래된 것인 엔도뉴클레아제; 및 (b) (i) 표적 데옥시리보핵산 서열에 혼성화하도록 구성된 가이드 리보핵산 서열; 및 (ii) 상기 엔도뉴클레아제에 결합하도록 구성된 tracr 리보핵산 서열을 포함하는, 상기 엔도뉴클레아제와 복합체를 형성하도록 구성된 조작된 가이드 리보핵산 구조체를 포함하는 조작된 뉴클레아제 시스템으로서, 상기 엔도뉴클레아제는 약 96 kDa 이하의 분자량을 갖는 것인 조작된 뉴클레아제 시스템을 제공한다. 일부 구현예에서, 상기 엔도뉴클레아제는 고세균 엔도뉴클레아제이다. 일부 구현예에서, 상기 엔도뉴클레아제는 클래스 2, 유형 II Cas 엔도뉴클레아제이다. 일부 구현예에서, 상기 엔도뉴클레아제는 서열번호: 1-198, 221-459, 463-612, 또는 617-668 중 어느 하나에 대해 적어도 70%, 적어도 75%, 적어도 80% 또는 적어도 90% 서열 동일성을 갖는 서열을 포함한다. 일부 구현예에서, 상기 엔도뉴클레아제는 RRxRR 모티프를 포함하는 아르기닌 풍부 영역 또는 PF14239 상동성을 갖는 도메인을 추가로 포함한다. 일부 구현예에서, 상기 아르기닌 풍부 영역 또는 상기 PF14239 상동성을 갖는 도메인은 서열번호: 1-198, 221-459, 463-612, 또는 617-668 중 어느 하나의 아르기닌 풍부 영역 또는 PF14239 상동성을 갖는 도메인에 대해 적어도 85%, 적어도 90%, 또는 적어도 95% 동일성을 갖는다. 일부 구현예에서, 상기 엔도뉴클레아제는 REC(인식) 도메인을 추가로 포함한다. 일부 구현예에서, 상기 REC 도메인은 서열번호: 1-198, 221-459, 463-612, 또는 617-668 중 어느 하나의 REC 도메인에 대해 적어도 85%, 적어도 90%, 또는 적어도 95% 동일성을 갖는다. 일부 구현예에서, 상기 엔도뉴클레아제는 BH(브릿지 나선) 도메인, WED(웨지) 도메인, 및 PI(PAM 상호작용) 도메인을 추가로 포함한다. 일부 구현예에서, 상기 BH 도메인, 상기 WED 도메인, 또는 상기 PI 도메인은 서열번호: 1-198, 221-459, 463-612, 또는 617-668 중 어느 하나의 BH 도메인, WED 도메인, 및/또는 PI 도메인에 대해 적어도 85%, 적어도

90%, 또는 적어도 95% 동일성을 갖는다.

[0008] 일부 양태에서, 본 개시내용은 (a) RuvC-I 도메인 및 HNH 도메인을 포함하는 엔도뉴클레아제; 및 (b) (i) 표적 데옥시리보핵산 서열에 혼성화하도록 구성된 가이드 리보핵산 서열; 및 (ii) 상기 엔도뉴클레아제에 결합하도록 구성된 리보핵산 서열을 포함하는 상기 엔도뉴클레아제와 복합체를 형성하도록 구성된 조작된 가이드 리보핵산 구조체를 포함하는 조작된 뉴클레아제 시스템으로서, 상기 엔도뉴클레아제는 서열번호: 1-198, 221-459, 463-612, 또는 617-668 중 어느 하나에 대해 적어도 70%, 적어도 75%, 적어도 80% 또는 적어도 90% 서열 동일성을 갖는 서열을 포함하는 것인 조작된 뉴클레아제 시스템을 제공한다. 일부 구현예에서, 상기 엔도뉴클레아제는 고세균 엔도뉴클레아제이다. 일부 구현예에서, 상기 엔도뉴클레아제는 클래스 2, 유형 II Cas 엔도뉴클레아제이다. 일부 구현예에서, 상기 엔도뉴클레아제는 RRxRR 모티프를 포함하는 아르기닌 풍부 영역 또는 PF14239 상동성을 갖는 도메인을 추가로 포함한다. 일부 구현예에서, 상기 아르기닌 풍부 영역 또는 상기 PF14239 상동성을 갖는 도메인은 서열번호: 1-198, 221-459, 463-612, 또는 617-668 중 어느 하나의 아르기닌 풍부 영역에 대해 적어도 85%, 적어도 90%, 또는 적어도 95% 동일성을 갖는다. 일부 구현예에서, 상기 엔도뉴클레아제는 REC(인식) 도메인을 추가로 포함한다. 일부 구현예에서, 상기 REC 도메인은 서열번호: 1-198, 221-459, 463-612, 또는 617-668 중 어느 하나의 REC 도메인에 대해 적어도 85%, 적어도 90%, 또는 적어도 95% 동일성을 갖는다. 일부 구현예에서, 상기 엔도뉴클레아제는 BH 도메인, WED 도메인, 및 PI 도메인을 추가로 포함한다. 일부 구현예에서, 상기 BH 도메인, 상기 WED 도메인, 또는 상기 PI 도메인은 서열번호: 1-198, 221-459, 463-612, 또는 617-668 중 어느 하나의 BH 도메인, WED 도메인, 및/또는 PI 도메인에 대해 적어도 85%, 적어도 90%, 또는 적어도 95% 동일성을 갖는다. 일부 구현예에서, 상기 엔도뉴클레아제는 배양되지 않은 미생물로부터 유래된다. 일부 구현예에서, 상기 엔도뉴클레아제에 결합하도록 구성된 상기 리보핵산 서열은 서열번호: 199-200, 460-461, 또는 669-673 중 어느 하나에 대해 적어도 80% 서열 동일성을 갖는 서열, 또는 서열번호: 201-203 또는 613-616 중 어느 하나의 비축퇴성 뉴클레오타이드에 대해 적어도 80% 서열 동일성을 갖는 서열을 포함한다. 일부 구현예에서, 상기 가이드 핵산 구조체는 서열번호: 201-203, 613-616 중 어느 하나의 비축퇴성 뉴클레오타이드에 대해 적어도 80% 동일성을 갖는 서열을 포함한다.

[0009] 일부 양태에서, 본 개시내용은 (a) (i) 표적 데옥시리보핵산 서열에 혼성화하도록 구성된 가이드 리보핵산 서열; 및 (ii) 엔도뉴클레아제에 결합하도록 구성된 리보핵산 서열로서, 상기 리보핵산 서열은 서열번호: 199-200, 460-461, 또는 669-673 중 어느 하나에 대해 적어도 80% 서열 동일성을 갖는 서열, 또는 서열번호: 201-203 또는 613-616 중 어느 하나의 비가변 뉴클레오타이드에 대해 적어도 80% 서열 동일성을 갖는 서열을 포함하는 것인 리보핵산 서열을 포함하는 조작된 가이드 리보핵산 구조체; 및 (b) 상기 조작된 가이드 리보핵산에 결합하도록 구성된 RNA 가이드된 엔도뉴클레아제를 포함하는 조작된 뉴클레아제 시스템을 제공한다. 일부 구현예에서, 상기 RNA 가이드된 엔도뉴클레아제는 고세균 엔도뉴클레아제이다. 일부 구현예에서, 상기 엔도뉴클레아제는 약 120 kDa 이하, 100 kDa 이하, 90 kDa 이하, 또는 60 kDa 이하의 분자량을 갖는다. 일부 구현예에서, 상기 조작된 가이드 리보핵산 구조체는 적어도 2개의 리보핵산 폴리뉴클레오타이드를 포함한다. 일부 구현예에서, 상기 조작된 가이드 리보핵산 구조체는 상기 가이드 리보핵산 서열 및 상기 tracr 리보핵산 서열을 포함하는 단일 리보핵산 폴리뉴클레오타이드를 포함한다. 일부 구현예에서, 상기 가이드 리보핵산 서열은 원핵생물, 박테리아, 고세균, 진핵생물, 진균, 식물, 포유동물, 또는 인간 게놈 서열에 상보적이다. 일부 구현예에서, 상기 가이드 리보핵산 서열은 15-24개 뉴클레오타이드 길이이다. 일부 구현예에서, 상기 엔도뉴클레아제는 상기 엔도뉴클레아제의 N- 또는 C-말단에 근접한 하나 이상의 핵 위치화 서열(NLS)을 포함한다. 일부 구현예에서, 상기 NLS는 서열번호: 205-220으로부터 선택된 서열을 포함한다. 일부 구현예에서, 시스템은 5'부터 3'까지 상기 표적 데옥시리보핵산 서열의 5'에 적어도 20개의 뉴클레오타이드의 서열을 포함하는 제1 상동성 암(arm), 적어도 10개의 뉴클레오타이드의 합성 DNA 서열, 및 상기 표적 서열의 3'에 적어도 20개의 뉴클레오타이드의 서열을 포함하는 제2 상동성 암을 포함하는 단일 또는 이중 가닥 DNA 복구 주형을 추가로 포함한다. 일부 구현예에서, 상기 제1 또는 제2 상동성 암은 적어도 40, 80, 120, 150, 200, 300, 500, 또는 1,000개의 뉴클레오타이드의 서열을 포함한다. 일부 구현예에서, 상기 시스템은 Mg^{2+}의 공급원을 추가로 포함한다. 일부 구현예에서, 상기 엔도뉴클레아제 및 상기 tracr 리보핵산 서열은 동일한 문(phylum) 내의 별개의 박테리아 종으로부터 유래된다. 일부 구현예에서, 상기 엔도뉴클레아제는 서열번호: 2-24 중 어느 하나에 대해 적어도 70% 서열 동일성을 갖는 서열을 포함하고, 상기 가이드 RNA 구조체는 스템 및 루프를 포함하는 헤어핀을 포함할 것으로 예측된 RNA 서열을 포함하며, 상기 스템은 적어도 12쌍의 리보뉴클레오타이드를 포함한다. 일부 구현예에서, 상기 가이드 RNA 구조체는 제2 스템 및 제2 루프를 추가로 포함하고, 제2 스템은 적어도 5쌍의 리보뉴클레오타이드를 포함한다. 일부 구현예에서, 상기 가이드 RNA 구조체는 적어도 2개의 헤어핀을 포함하는 RNA 구조체를 추가로 포함한다. 일부 구현예에서, 상기 엔도뉴클레아제는 서열번호: 1에 대해 적어도 70% 서열 동일성을 갖는 서열을 포함하고, 상기 가

이드 RNA 구조체는 스템 및 루프를 포함하는 적어도 4개의 헤어핀을 포함할 것으로 예측된 RNA 서열을 포함한다. 일부 구현예에서: a) 상기 엔도뉴클레아제는 서열번호: 1, 2, 10, 17, 또는 613-616 중 어느 하나에 대해 적어도 70%, 적어도 80%, 또는 적어도 90% 동일한 서열을 포함하고; b) 상기 가이드 RNA 구조체는 서열번호: 199-200 또는 669-673 중 어느 하나 또는 서열번호: 201-203 또는 613-616 중 어느 하나의 비가변 뉴클레오타이드에 대해 적어도 70%, 적어도 80%, 또는 적어도 90% 동일한 서열을 포함한다. 일부 구현예에서: a) 상기 엔도뉴클레아제는 서열번호: 1-24, 462-488, 또는 501-612 중 어느 하나에 대해 적어도 70%, 적어도 80%, 또는 적어도 90% 동일한 서열을 포함하고; b) 상기 가이드 RNA 구조체는 서열번호: 199-200 또는 669-673 중 어느 하나 또는 서열번호: 201-203 또는 613-616 중 어느 하나의 비가변 뉴클레오타이드에 대해 적어도 70%, 적어도 80%, 또는 적어도 90% 동일한 서열을 포함한다. 일부 구현예에서: a) 상기 엔도뉴클레아제는 서열번호 2, 10, 또는 17 중 어느 하나에 대해 적어도 70%, 적어도 80%, 또는 적어도 90% 동일한 서열을 포함하고; b) 상기 가이드 RNA 구조체는 서열번호: 202-203 또는 613-614 중 어느 하나의 비가변 뉴클레오타이드에 대해 적어도 70%, 적어도 80%, 또는 적어도 90% 동일한 서열을 포함한다. 일부 구현예에서: a) 상기 엔도뉴클레아제는 서열번호: 25-198, 221-459, 또는 489-580 중 어느 하나에 대해 적어도 70%, 적어도 80%, 또는 적어도 90% 동일한 서열을 포함하고; b) 상기 가이드 RNA 구조체는 클래스 2, 유형 II sgRNA 또는 tracr 서열에 대해 적어도 70%, 적어도 80%, 또는 적어도 90% 동일한 서열을 포함한다. 일부 구현예에서, 상기 서열 동일성은 BLASTP, CLUSTALW, MUSCLE, MAFFT, 또는 스미스-워터맨(Smith-Waterman) 상동성 검색 알고리즘의 파라미터를 갖는 CLUSTALW에 의해 결정된다. 일부 구현예에서, 상기 서열 동일성은 3의 단어길이(W), 10의 기대값(E), 및 11의 존재, 1의 확장에서 갭 비용을 설정하는 BLOSUM62 스코어링 매트릭스의 파라미터를 사용하고 조건부 구성 스코어 매트릭스 조정을 사용하는 상기 BLASTP 상동성 검색 알고리즘에 의해 결정된다. 일부 구현예에서, 상기 엔도뉴클레아제는 Cas9 엔도뉴클레아제, Cas14 엔도뉴클레아제, Cas12a 엔도뉴클레아제, Cas12b 엔도뉴클레아제, Cas12c 엔도뉴클레아제, Cas12d 엔도뉴클레아제, Cas12e 엔도뉴클레아제, Cas13a 엔도뉴클레아제, Cas13b 엔도뉴클레아제, Cas13c 엔도뉴클레아제, 또는 Cas 13d 엔도뉴클레아제가 아니다. 일부 구현예에서, 상기 엔도뉴클레아제는 Cas9 엔도뉴클레아제에 대해 80% 미만의 동일성을 갖는다.

[0010] 일부 양태에서, 본 개시내용은 a) 표적 DNA 분자 내의 표적 서열에 상보적인 뉴클레오타이드 서열을 포함하는 DNA 표적화 분절; 및 b) 이중 가닥 RNA(dsRNA) 듀플렉스를 형성하기 위해 혼성화하는 뉴클레오타이드의 2개의 상보적 스트레치를 포함하는 단백질 결합 분절을 포함하는 조작된 단일 가이드 리보핵산 폴리뉴클레오타이드로서, 상기 뉴클레오타이드의 2개의 상보적 스트레치는 개재하는 뉴클레오타이드와 서로 공유적으로 연결되고, 상기 조작된 가이드 리보핵산 폴리뉴클레오타이드는 서열번호: 1-198, 221-459, 463-612 또는 617-668 중 어느 하나에 대해 적어도 75% 서열 동일성을 갖는 변이체를 포함하는 엔도뉴클레아제와 복합체를 형성하도록 구성되는 것인 조작된 단일 가이드 리보핵산 폴리뉴클레오타이드를 제공한다. 일부 구현예에서, 상기 DNA 표적화 분절은 상기 뉴클레오타이드의 2개의 상보적 스트레치의 둘 모두의 5'에 위치한다. 일부 구현예에서: a) 상기 단백질 결합 분절은 서열번호: 199-200 또는 669-673 중 어느 하나에 대해 적어도 70%, 적어도 80%, 또는 적어도 90% 동일한 서열을 포함하고; b) 상기 단백질 결합 분절은 서열번호: 201-203 또는 613-616 중 어느 하나의 비가변 뉴클레오타이드에 대해 적어도 70%, 적어도 80%, 또는 적어도 90% 동일한 서열을 포함한다. 일부 구현예에서: a) 상기 엔도뉴클레아제는 서열번호 2, 10, 또는 17 중 어느 하나에 대해 적어도 70%, 적어도 80%, 또는 적어도 90% 동일한 서열을 포함하고; b) 상기 가이드 RNA 구조체는 서열번호: 200 또는 서열번호: 202-203 또는 613-614의 비가변 뉴클레오타이드 중 적어도 하나에 대해 적어도 70%, 적어도 80%, 또는 적어도 90% 동일한 서열을 포함한다. 일부 구현예에서: a) 상기 엔도뉴클레아제는 서열번호: 25-198, 221-459, 또는 489-580 중 어느 하나에 대해 적어도 70%, 적어도 80%, 또는 적어도 90% 동일한 서열을 포함하고; b) 상기 가이드 RNA 구조체는 클래스 2, 유형 II sgRNA에 대해 적어도 70%, 적어도 80%, 또는 적어도 90% 동일한 서열을 포함한다. 일부 구현예에서, 상기 엔도뉴클레아제는 상기 엔도뉴클레아제에 결합된 염기 에디터 또는 히스톤 에디터를 추가로 포함한다. 일부 구현예에서, 상기 염기 에디터는 아데노신 데아미나제이다. 일부 구현예에서, 상기 아데노신 데아미나제는 ADAR1 또는 ADAR2를 포함한다. 일부 구현예에서, 상기 염기 에디터는 시토신 데아미나제이다. 일부 구현예에서, 상기 시토신 데아미나제는 APOBEC1, APOBEC2, APOBEC3A, APOBEC3B, APOBEC3C, APOBEC3D, APOBEC3F, APOBEC3G, APOBEC3H, 또는 APOBEC4를 포함한다.

[0011] 일부 양태에서, 본 개시내용은 본원에 기재된 조작된 가이드 리보핵산 폴리뉴클레오타이드 중 어느 것을 코딩하는 데옥시리보핵산 폴리뉴클레오타이드를 제공한다.

[0012] 일부 양태에서, 본 개시내용은 유기체에서의 발현을 위해 최적화된 조작된 핵산 서열을 포함하는 핵산으로서, 상기 핵산은 RuvC 도메인 및 HNH 도메인을 포함하는 클래스 2, 유형 II Cas 엔도뉴클레아제를 코딩하고, 상기 엔도뉴클레아제는 배양되지 않은 미생물로부터 유래되며, 상기 엔도뉴클레아제는 약 120 kDa 이하, 100 kDa 이

하, 90 kDa 이하, 60 kDa 이하, 또는 30 kDa 이하의 분자량을 갖는 것인 핵산을 제공한다. 일부 구현예에서, 상기 엔도뉴클레아제는 서열번호: 1-198, 221-459, 463-612, 또는 617-668 또는 그에 대해 적어도 70% 서열 동일성을 갖는 이의 변이체를 포함한다. 일부 구현예에서, 상기 엔도뉴클레아제는 상기 엔도뉴클레아제의 N- 또는 C-말단에 근접한 하나 이상의 핵 위치화 서열(NLS)을 코딩하는 서열을 추가로 포함한다. 일부 구현예에서, 상기 NLS는 서열번호: 205-220으로부터 선택된 서열을 포함한다. 일부 구현예에서, 상기 유기체는 원핵생물, 박테리아, 진핵생물, 진균, 식물, 포유동물, 설치류, 또는 인간이다. 일부 구현예에서, 상기 유기체는 원핵생물 또는 박테리아이고, 상기 유기체는 상기 엔도뉴클레아제가 유래된 유기체와 상이한 유기체이다. 일부 구현예에서, 상기 유기체는 상기 배양되지 않은 미생물이 아니다.

[0013] 일부 양태에서, 본 개시내용은 RuvC-I 도메인 및 HNH 도메인을 포함하는 RNA 가이드된 엔도뉴클레아제를 코딩하는 핵산 서열을 포함하는 벡터로서, 상기 엔도뉴클레아제는 배양되지 않은 미생물로부터 유래되고, 상기 엔도뉴클레아제는 약 120 kDa 이하, 100 kDa 이하, 90 kDa 이하, 또는 60 kDa 이하의 분자량을 가지며, RNA 가이드된 엔도뉴클레아제는 선택적으로 고세균성인 벡터를 제공한다. 일부 구현예에서, 상기 엔도뉴클레아제는 RRxRR 모티프를 포함하는 아르기닌 풍부 영역 또는 PF14239 상동성을 갖는 도메인을 추가로 포함한다. 일부 구현예에서, 상기 엔도뉴클레아제는 REC(인식) 도메인을 추가로 포함한다. 일부 구현예에서, 상기 엔도뉴클레아제는 BH 도메인, WED 도메인, 및 PI 도메인을 추가로 포함한다.

[0014] 일부 양태에서, 본 개시내용은 본원에 기재된 임의의 핵산을 포함하는 벡터를 제공한다. 일부 구현예에서, 벡터는 상기 엔도뉴클레아제와 복합체를 형성하도록 구성된 조작된 가이드 리보핵산 구조체를 코딩하는 핵산을 추가로 포함하며, 상기 조작된 가이드 리보핵산 구조체는: a) 표적 데옥시리보핵산 서열에 혼성화하도록 구성된 가이드 리보핵산 서열; 및 b) 상기 엔도뉴클레아제에 결합하도록 구성된 tracr 리보핵산 서열을 포함한다. 일부 구현예에서, 벡터는 플라스미드, 미니서클, CELiD, 아데노 연관 바이러스(AAV) 유래 비리온, 또는 렌티바이러스이다.

[0015] 일부 양태에서, 본 개시내용은 본원에 기재된 임의의 벡터를 포함하는 세포를 제공한다. 일부 구현예에서, 상기 세포는 박테리아, 고세균, 진균, 진핵생물, 포유동물, 또는 식물 세포이다. 일부 구현예에서, 상기 세포는 박테리아 세포이다.

[0016] 일부 양태에서, 본 개시내용은 본원에 기재된 임의의 세포를 배양하는 단계를 포함하는, 엔도뉴클레아제를 제조하는 방법을 제공한다.

[0017] 일부 양태에서, 본 개시내용은 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드를 결합, 절단, 마킹 또는 변형시키는 방법을 제공하며, 이는: (a) 상기 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드를 상기 엔도뉴클레아제 및 상기 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드에 결합하도록 구성된 조작된 가이드 리보핵산 구조체와 복합된 클래스 2, 유형 II Cas 엔도뉴클레아제와 접촉시키는 단계를 포함하고; (b) 상기 이중가닥 데옥시리보핵산 폴리뉴클레오타이드는 프로토스페이서 인접 모티프(PAM)를 포함하며; 상기 엔도뉴클레아제는 약 120 kDa 이하, 100 kDa 이하, 90 kDa 이하, 또는 60 kDa 이하의 분자량을 갖는다. 일부 구현예에서, 상기 엔도뉴클레아제는 상기 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드를 절단하고, 상기 PAM은 NGG를 포함한다. 일부 구현예에서, 상기 엔도뉴클레아제는 상기 PAM으로부터 6-8개 뉴클레오타이드 또는 7개 뉴클레오타이드에서 상기 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드를 절단한다. 일부 구현예에서, 상기 엔도뉴클레아제는 서열번호: 1-198, 221-459, 463-612, 또는 617-668 중 어느 하나에 대해 적어도 70%, 적어도 75%, 적어도 80% 또는 적어도 90% 서열 동일성을 갖는 변이체를 포함한다.

[0018] 일부 양태에서, 본 개시내용은 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드를 결합, 절단, 마킹 또는 변형시키는 방법을 제공하며, 이는: (a) 상기 이중가닥 데옥시리보핵산 폴리뉴클레오타이드를 상기 엔도뉴클레아제 및 상기 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드에 결합하도록 구성된 조작된 가이드 리보핵산 구조체와 복합된 RNA 가이드된 고세균 엔도뉴클레아제와 접촉시키는 단계를 포함하고; 상기 이중가닥 데옥시리보핵산 폴리뉴클레오타이드는 프로토스페이서 인접 모티프(PAM)를 포함하며; 상기 엔도뉴클레아제는 서열번호: 1-198, 221-459, 463-612, 또는 617-668 중 어느 하나에 대해 적어도 70%, 적어도 75%, 적어도 80% 또는 적어도 90% 서열 동일성을 갖는 변이체를 포함한다. 일부 구현예에서, 상기 엔도뉴클레아제는 상기 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드를 절단하고, 상기 PAM은 NGG를 포함한다. 일부 구현예에서, 상기 엔도뉴클레아제는 상기 PAM으로부터 6-8 또는 7개 뉴클레오타이드에서 상기 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드를 절단한다. 일부 구현예에서, 상기 클래스 2, 유형 II Cas 엔도뉴클레아제는 Cas9 엔도뉴클레아제, Cas14 엔도뉴클레아제, Cas12a 엔도뉴클레아제, Cas12b 엔도뉴클레아제, Cas12c 엔도뉴클레아제, Cas12d 엔도뉴클레아제, Cas12e 엔도

뉴클레아제, Cas13a 엔도뉴클레아제, Cas13b 엔도뉴클레아제, Cas13c 엔도뉴클레아제, 또는 Cas 13d 엔도뉴클레아제가 아니다. 일부 구현예에서, 상기 클래스 2, 유형 II Cas 엔도뉴클레아제는 배양되지 않은 미생물로부터 유래된다. 일부 구현예에서, 상기 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드는 원핵생물, 고세균, 박테리아, 진핵생물, 식물, 진균, 포유동물, 설치류, 또는 인간 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드이다. 일부 구현예에서, 상기 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드는 상기 엔도뉴클레아제가 유래된 종 이외의 종으로부터의 원핵생물, 고세균, 또는 박테리아 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드이다.

[0019] 일부 양태에서, 본 개시내용은 표적 핵산 유전자좌를 변형시키는 방법을 제공하며, 상기 방법은 본원에 기재된 조작된 뉴클레아제 시스템 중 어느 것을 상기 표적 핵산 유전자좌에 전달하는 단계를 포함하고, 상기 엔도뉴클레아제는 상기 조작된 가이드 리보핵산 구조체와 복합체를 형성하도록 구성되며, 상기 복합체는 상기 표적 핵산 유전자좌에 대한 상기 복합체의 결합시, 상기 복합체가 상기 표적 핵산 유전자좌를 변형시키도록 구성된다. 일부 구현예에서, 상기 표적 핵산 유전자좌를 변형시키는 것은 상기 표적 핵산 유전자좌를 결합, 니킹, 절단, 또는 마킹하는 것을 포함한다. 일부 구현예에서, 상기 표적 핵산 유전자좌는 데옥시리보핵산(DNA) 또는 리보핵산(RNA)을 포함한다. 일부 구현예에서, 상기 표적 핵산은 게놈 진핵 DNA, 고세균 DNA, 바이러스 DNA, 또는 박테리아 DNA를 포함한다. 일부 구현예에서, 상기 표적 핵산은 박테리아 DNA를 포함하며, 상기 박테리아 DNA는 상기 엔도뉴클레아제가 유래된 종과 상이한 박테리아 또는 고세균 종으로부터 유래된다. 일부 구현예에서, 상기 표적 핵산 유전자좌는 시험관 내에 있다. 일부 구현예에서, 상기 표적 핵산 유전자좌는 세포 내에 있다. 일부 구현예에서, 상기 엔도뉴클레아제 및 상기 조작된 가이드 핵산 구조체는 별개의 핵산 분자에 의해 코딩된다. 일부 구현예에서, 상기 세포는 원핵 세포, 박테리아 세포, 고세균 세포, 진핵 세포, 진균 세포, 식물 세포, 동물 세포, 포유동물 세포, 설치류 세포, 영장류 세포, 또는 인간 세포이다. 일부 구현예에서, 상기 세포는 상기 엔도뉴클레아제가 유래된 종과 상이한 종으로부터 유래된다. 일부 구현예에서, 상기 조작된 뉴클레아제 시스템을 상기 표적 핵산 유전자좌에 전달하는 것은 본원에 기재된 임의의 핵산 또는 본원에 기재된 임의의 벡터를 전달하는 것을 포함한다. 일부 구현예에서, 상기 조작된 뉴클레아제 시스템을 상기 표적 핵산 유전자좌에 전달하는 것은 상기 엔도뉴클레아제를 코딩하는 오픈 리딩 프레임을 포함하는 핵산을 전달하는 것을 포함한다. 일부 구현예에서, 상기 핵산은 상기 엔도뉴클레아제를 코딩하는 상기 오픈 리딩 프레임이 작동가능하게 연결된 프로모터를 포함한다. 일부 구현예에서, 상기 조작된 뉴클레아제 시스템을 상기 표적 핵산 유전자좌에 전달하는 것은 상기 엔도뉴클레아제를 코딩하는 상기 오픈 리딩 프레임을 함유하는 캡핑된 mRNA를 전달하는 것을 포함한다. 일부 구현예에서, 상기 조작된 뉴클레아제 시스템을 상기 표적 핵산 유전자좌에 전달하는 것은 번역된 폴리펩타이드를 전달하는 것을 포함한다. 일부 구현예에서, 상기 조작된 뉴클레아제 시스템을 상기 표적 핵산 유전자좌에 전달하는 것은 리보핵산(RNA) pol III 프로모터에 작동가능하게 연결된 상기 조작된 가이드 리보핵산 구조체를 코딩하는 데옥시리보핵산(DNA)을 전달하는 것을 포함한다. 일부 구현예에서, 상기 엔도뉴클레아제는 상기 표적 유전자좌에서 또는 그 근위에서 단일 가닥 파단 또는 이중 가닥 파단을 유도한다. 일부 구현예에서, 상기 엔도뉴클레아제는 프로토스페이서 인접 모티프(PAM)로부터 5'에서 상기 표적 유전자좌의 근위에서 이중 가닥 파단을 유도한다. 일부 구현예에서, 상기 엔도뉴클레아제는 상기 PAM으로부터 5'의 6-8개 뉴클레오타이드 또는 7개 뉴클레오타이드에서 이중 가닥 파단을 유도한다. 일부 구현예에서, 상기 조작된 뉴클레아제 시스템은 상기 표적 유전자좌 내 또는 근위에서 뉴클레오타이드 염기의 화학적 변형 또는 상기 표적 유전자좌 내 또는 근위에서 히스톤의 화학적 변형을 유도한다. 일부 구현예에서, 상기 화학적 변형은 아데노신 또는 시토신 뉴클레오타이드의 탈아민화이다. 일부 구현예에서, 상기 엔도뉴클레아제는 상기 엔도뉴클레아제에 결합된 염기 에디터를 추가로 포함한다. 일부 구현예에서, 상기 염기 에디터는 아데노신 데아미나제이다. 일부 구현예에서, 상기 아데노신 데아미나제는 ADAR1 또는 ADAR2를 포함한다. 일부 구현예에서, 상기 염기 에디터는 시토신 데아미나제이다. 일부 구현예에서, 상기 시토신 데아미나제는 APOBEC1, APOBEC2, APOBEC3A, APOBEC3B, APOBEC3C, APOBEC3D, APOBEC3F, APOBEC3G, APOBEC3H, 또는 APOBEC4를 포함한다.

[0020] 본 개시내용의 추가적인 양태 및 이점은 본 개시내용의 예시적인 실시예만이 도시되고 설명된 하기 상세한 설명으로부터 당업자에게 쉽게 명백해질 것이다. 인식되는 바와 같이, 본 개시내용은 다른 및 상이한 구현예가 가능하며, 그의 몇 가지 세부사항은 모두 개시내용으로부터 벗어나지 않으면서 다양한 명백한 측면에서 변형될 수 있다. 따라서, 도면 및 설명은 본질적으로 예시적이며 제한하지 않는 것으로 간주되어야 한다.

[0021] 참조에 의한 포함

[0022] 본 명세서에 언급된 모든 간행물, 특허 및 특허 출원은 각 개별 간행물, 특허 또는 특허 출원이 참조로 포함된 것으로 구체적으로 그리고 개별적으로 표시된 것과 동일한 정도로 참조로 본원에 포함된다.

도면의 간단한 설명

[0023] 본 발명의 신규한 특징들은 첨부된 청구범위에서 상세히 제시된다. 본 발명의 특징 및 이점은 본 발명의 원리가 이용되는 예시적인 구현예를 제시하는 하기 상세한 설명 및 첨부 도면(또한 본원에서 "도")을 참조하여 더 잘 이해될 것이다:

도 1은 상이한 클래스 및 유형의 CRISPR/Cas 유전자좌의 상동성 관계를 나타내는 덴드로그램을 도시한다. 클래스 2, 유형 II-A, II-B, 및 II-C Cas 시스템 대비 본원에 기재된 SMART I 및 II Cas 효소 클래스가 나타나 있으며, 이는 이들 시스템이 II-A, II-B 및 II-C보다는 별개의 클래스로 그룹화된다는 것을 입증한다. (A)는 Cas9 참조 서열의 문맥에서 SMART 계통발생 트리(phylogenetic tree)를 나타내고, 여기서 SMART 효과기는 Cas9 참조 서열(유형 II-A, II-B 및 II-C)으로부터 멀리 떨어져 클러스터링되며; (B)는 SMART 효소의 서브그룹을 예시하는 SMART 계통발생 트리를 나타낸다.

도 2는 SMART I 및 II 효소가 Cas9 유사 효소보다 낮은 분자량에서 클러스터링된다는 것을 보여주는, 본원에 기재된 SMART 효과기에 대한 길이 분포를 나타낸다. SMART 뉴클레아제는 약 400 aa 주위에 하나의 피크(SMART II) 및 약 750 aa 주위에 두 번째 피크(SMART I)를 갖는 쌍봉 분포를 보여준다. Cas9 뉴클레아제는 또한 1,100 aa (예컨대, SaCas9) 및 1,300 aa(예컨대, SpCas9) 주위에 피크를 갖는 쌍봉 분포를 나타낸다.

도 3은 '작은' 유형 II 뉴클레아제 MG33-1, MG35-236의 게놈 문맥을 도시한다. SMART 뉴클레아제 및 CRISPR 부속 단백질은 진회색 화살표로 나타나 있고, 다른 유전자는 연회색 화살표로 도시되어 있다. 게놈 단편 내의 모든 유전자에 대해 예측된 도메인이 화살표 아래에 회색 상자로 나타나 있다. 하기가 나타나 있다: (A) SMART II로부터 하류에 트랜스포사제 TnpA 및 TnpB를 갖는 예측된 삽입 서열을 보여주는, SMART I MG33-1 뉴클레아제 및 SMART II 뉴클레아제 MG35-236으로부터 상류에 코딩된 CRISPR 유전자좌의 게놈 문맥; (B) SMART I 뉴클레아제 MG34-1의 게놈 문맥, 여기서 환경적 발현 시퀀싱 리드는 CRISPR 어레이 및 예측된 tracrRNA 하에 정렬되어 나타나 있고, 영역에 대한 전사체 커버리지는 컨티그(contig) 서열 위에 예시되어 있으며; (C) SMART I 뉴클레아제 MG34-16의 게놈 문맥, 여기서 환경적 발현 시퀀싱 리드는 CRISPR 어레이 및 예측된 tracrRNA 하에 정렬되어 나타나 있고, 영역에 대한 전사체 커버리지는 컨티그 서열 위에 예시되어 있으며; (D) (D)에서의 MG34-16 CRISPR 어레이로부터 스페이서 7에 의해 표적화된 게놈 단편, 여기서 게놈 단편은 바이러스 특이적 유전자 주석 터미나제 및 포털에 기초하여 파지로부터 유래된 것으로 확인되었고; 삽도는 미지의 기능의 바이러스 유전자의 C 말단을 표적화하는 MG34-16 스페이서 7의 위치를 보여주며 -- MG34-16에 대한 추정되는 NGG PAM이 스페이서 매치로부터 하류에 회색 상자로 강조되어 있다.

도 4는 예시적인 SMART 엔도뉴클레아제(MG33-1(서열번호: 1), MG33-2(서열번호: 463), MG33-3(서열번호: 464), MG34-1(서열번호: 2), MG 34-9(서열번호: 10), MG34-16(서열번호: 17), MG102-1(서열번호: 581), MG102-2(서열번호: 582), MG35-1(서열번호: 25), MG35-2(서열번호: 26), MG35-3(서열번호: 27), MG35-102(서열번호: 126), MG35-236(서열번호: 284), MG35-419(서열번호: 222), MG35-420(서열번호: 223) 및 MG35-421(서열번호: 224))의 다중 서열 정렬을 나타내며, 여기서 참조 도메인으로 사용된 SaCas9의 서열은 참조 서열 아래에 직사각형으로 나타나 있고, 촉매 잔기는 각 서열 위에 정사각형으로 나타나 있다. 하기가 나타나 있다: (A) RuvC-I 및 브릿지 나선 도메인을 함유하는 엔도뉴클레아제 영역의 정렬; (B) RuvC-III 도메인을 함유하는 영역의 정렬; 및 (C) RuvC-II 및 HNH 도메인을 포함하는 영역의 정렬.

도 5는 예로서 MG34-1을 사용한 SMART I 엔도뉴클레아제에 대한 예시적인 도메인 조직화를 도시한다. 하기가 나타나 있다: (A) 3개의 RuvC 도메인, 브릿지 나선("BH"), 인식 도메인("REC")을 중단시키는 Pfam PF14239와 상동성을 갖는 도메인, HNH 엔도뉴클레아제 도메인("HNH"), 웨지 도메인("WED"), 및 PAM 상호작용 도메인(PI)으로 구성된 SMART I 뉴클레아제의 예측된 도메인 아키텍처를 나타내는 도면; 및 (B) 참조 Cas9 뉴클레아제 서열 대비 2개의 SMART I 뉴클레아제의 다중 서열 정렬 개요, 여기서 RuvC 및 HNH 촉매 잔기는 각 서열 위에 검은색 막대로 나타나 있고, 3D 공간에서 SaCas의 결정 구조와 정렬되는 영역은 둥근 상자로 나타나 있으며, 점선은 SMART와 SaCas9의 3D 구조 예측 사이에서 3D 공간에서 정렬이 불량하거나 없는 영역을 나타낸다.

도 6은 예로서 MG35 패밀리 효소(MG35-3, MG35-4)를 사용한 SMART II 엔도뉴클레아제에 대한 예시적인 도메인 조직화를 도시한다. 하기가 나타나 있다: (A) 3개의 RuvC 도메인, Pfam PF14239와 상동성을 갖는 도메인, HNH 엔도뉴클레아제 도메인, 미지의 도메인 및 인식 도메인(REC)으로 구성된 SMART II 뉴클레아제의 예측된 도메인 구조를 나타내는 도면; (B) 참조 Cas9 뉴클레아제 서열 대비 2개의 SMART II 뉴클레아제의 다중 서열 정렬 개요, 여기서 RuvC 및 HNH 촉매 잔기는 각 서열 위에 검은색 막대로 나타나 있고, 3D 공간에서 SaCas의 결정 구

조와 정렬되는 영역은 둥근 상자로 나타나 있으며, 가이드/표적/PAM 서열을 인식하는 데 관여할 수 있는 3D 구조 예측로부터 확인된 잔기는 MG35-419 서열 위에(RRXRR 및 REC 도메인 내에) 진회색 상자로 표시되어 있다.

도 7은 SMART 효소의 다양한 특징을 예시한다. 하기가 나타나 있다: (A) 본원에 도시된 다양한 효소의 SMART I 도메인 대 spCas9의 동일성을 나타내는 점도표로서, 이는 이들이 최대 약 35% 서열 동일성을 갖는다는 것을 보여주고; (B) 본원에 기재된 효소의 개별적인 SMART I 도메인의 길이의 점도표.

도 8은 다양한 SMART 특이적 모티프 대 Cas9 뉴클레아제 서열에서 예측된 모티프의 카운트 분포를 예시하며, 이는 이들 모티프가 SMART 효소에서 더 흔히 발생한다는 것을 보여주고; 모티프는 803개의 참조 Cas9 서열(유형 II-A, II-B, 및 II-C), 84개의 SMART I 서열, 및 471개의 SMART II 서열 상에서 예측되었다. 하기가 나타나 있다: (A) 다양한 유형의 클래스 2 Cas 효소에서 Zn 결합 리본 모티프($CX_{[2-4]}C$ 및 $CX_{[2-4]}H$)의 수 빈도의 상자 플롯; 및 (B) 다양한 유형의 클래스 2 Cas 효소에서 RRXRR 모티프의 수 빈도의 히스토그램. (A) 및 (B)에서 선은 평균 수 값을 추적하고, 이상치는 점으로 표시되어 있다.

도 9는 SMART I 엔도뉴클레아제를 사용한 절단 활성을 위한 설계된 단일 가이드 RNA(sgRNA)의 예측된 가이드 RNA 구조체를 도시한다. 하기가 나타나 있다: (A) MG34-1 sgRNA 1; (B) MG34-1 sgRNA 2; (C) MG34-9 sgRNA 1, 및 (D) MG34-16 sgRNA 1.

도 10은 실시예 1에 기재된 바와 같은 SMART I 뉴클레아제의 절단 특성화를 도시한다. (A)는 2개의 sgRNA 설계를 갖는 MG34-1 대 음성 대조군에 대한 절단 분석의 라이게이션 산물의 Agilet TapeStation 겔을 나타낸다. 레인 L3: 사다리. 레인 A4: Apo, sgRNA 없음. 레인 B4 및 C4: 시험된 MG34-1 sgRNA(sg1: 서열번호 612, sg2: 613). 절단 산물 밴드는 화살표로 라벨링되어 있다. 레인 G3 및 H3: 회색으로 표시되며 이 실험과 관련이 없다. (B)는 MG34-1, 34-9 및 34-16의 활성을 보여주는 라이게이션 산물의 PCR 겔을 나타낸다. 레인 1: 사다리. 레인 2-7: MG34-1에 대한 6개의 스페이서 길이를 갖는 sgRNA 설계. 레인 8 및 9: 각각 34-9 및 34-16에 대한 sgRNA 설계. 화살표는 절단 확인 밴드를 나타낸다.

도 11은 MG34 뉴클레아제에 대한 서열 절단 선호도를 예시한다. (A)는 sgRNA 1(상단, 서열번호: 612) 및 sgRNA 2(하단, 서열번호: 613)를 갖는 MG34-1에 대한 공통 PAM 서열(NGGN)의 SeqLogo 표현을 나타낸다. (B)는 MG34-1에 대한 절단 부위의 위치를 보여주는 히스토그램을 나타내며, 이는 MG34-1이 PAM으로부터 약 위치 7에서 절단하는 것을 선호한다는 것을 입증한다. (C)는 생어 시퀀싱 크로마토그램이 MG34-9에 대한 바람직한 NGG PAM(상자로 강조 표시됨)을 보여준다는 것을 나타낸다. 화살표는 PAM으로부터 위치 7에 있는 절단 부위를 나타낸다.

도 12는 MG 34-1에 대한 *E. coli*에서의 플라스미드 표적화 실험의 결과를 예시한다. (A)는 플라스미드 절단을 입증하는 *E. coli* 균주의 복제 플레이팅(replica plating)을 나타내고; MG34-1 및 sgRNA를 발현하는 *E. coli*는 sgRNA(+sp)에 대한 표적을 함유하는 카나마이신 내성 플라스미드로 형질전환되었다. 성장 장애(+sp) 대 음성 대조군(표적 및 PAM 없음(-sp))을 보여주는 플레이트 사분면은 효소에 의한 성공적인 표적화 및 절단을 나타낸다. 실험을 2회 반복하였고 삼중으로 수행하였다. (B)는 표적 조건(+sp) 대 비표적 대조군(-sp)에서의 성장 억제를 보여주는 A의 복제 플레이팅 실험으로부터의 콜로니 형성 단위(cfu) 측정값의 그래프를 보여주며, 이는 플라스미드가 절단되었음을 입증한다.

도 13은 MG35-419에 대한 SMART 시스템의 예시적인 게놈 문맥을 나타낸다. SMART 뉴클레아제는 진회색 화살표로 나타나 있고, 다른 유전자는 연회색 화살표로 나타나 있다. 게놈 단편 내의 모든 유전자에 대해 예측된 도메인은 화살표 아래에 회색 상자로 나타나 있다. 환경적 발현 시퀀싱 리드는 (A)에서 CRISPR 어레이 아래에 그리고 (B)에서 효과기로부터 상류에 정렬되어 나타나 있다. 발현을 나타내는 영역에 대한 전사체 커버리지는 컨티그 서열 위에 예시되어 있다. (A)는 SMART II MG35-419 효과기 및 부근에서 코딩된 CRISPR 유전자좌의 게놈 문맥을 나타낸다. (B)는 전사된 5' UTR을 나타내는 SMART II 효과기 MG35-3의 게놈 문맥을 나타낸다.

도 14는 SMART II MG35-419에 대한 3D 구조 예측을 나타낸다. 이 3D 모델은 크기가 절반 미만임에도 불구하고 SaCas9 결정 구조의 영역과 잘 정렬된다. SaCas9 주형과 정렬된 영역은 촉매 로브(RuvC-I, HNH 및 RuvC-III 도메인) 및 인식(REC) 로브의 짧은 영역을 포함한다. SMART II 특이적 도메인은 RRXRR 모티프 및 Pfam PF14239와 상동성을 함유하는 도메인, 및 미지의 기능의 도메인을 포함한다.

도 15는 SMART II 효과기에 대한 예비적인 절단 분석의 결과를 도시한다. MG35-420(서열번호: 223) 단백질 준비물을 전체 유전자좌가 발현된 TXTL 추출물에서 절단 활성에 대해 시험하였다. 실험은 단백질 준비물을 PAM 라이브러리(dsDNA 표적), 순방향 및 역방향 배향(fw 및 rv) 모두에서 유전자좌(cr1)에서 예측된 반복적인 영역, 및 필요한 보조 인자를 잠재적으로 코딩하는 유전자간 영역과 함께 인큐베이션하였다. 레인 2-9(cr 어레이 없음):

반복적인 영역이 없는 대조군 실험. Apo: 표적 PAM 라이브러리를 갖는 단백질 준비물 단독. 라벨 1 - 2.5는 7개의 상이한 유전자간 영역을 나타낸다. -IG: 대조군으로서 포함되는 유전자간 영역이 없음. 라이게이션 산물의 PCR 겔은 dsDNA 절단을 시사하는 추정적인 절단 밴드(화살표)를 나타낸다.

발명을 실시하기 위한 구체적인 내용

[0024] 서열 목록의 간단한 설명

[0025] 본원과 함께 제출된 서열 목록은 본 개시내용에 따른 방법, 조성물 및 시스템에 사용하기 위한 예시적인 폴리뉴클레오타이드 및 폴리펩타이드 서열을 제공한다. 다음은 그 안에 있는 서열의 예시적인 설명이다.

[0026] **MG33 뉴클레아제**

[0027] 서열번호: 1 및 463-486은 MG33 뉴클레아제의 전장 펩타이드 서열을 나타낸다.

[0028] 서열번호: 199 및 669-670은 MG33 뉴클레아제와 함께 기능할 것으로 예측된 tracrRNA의 뉴클레오타이드 서열을 나타낸다.

[0029] 서열번호: 201은 MG33 뉴클레아제와 함께 기능할 것으로 예측된 예측된 단일 가이드 RNA(sgRNA) 서열의 뉴클레오타이드 서열을 나타낸다. "N"은 가변 잔기를 나타내고 비-N-잔기는 스캐폴드 서열을 나타낸다.

[0030] **MG34 뉴클레아제**

[0031] 서열번호: 2-24 및 487-488은 MG34 뉴클레아제의 전장 펩타이드 서열을 나타낸다.

[0032] 서열번호: 200은 MG34 뉴클레아제와 함께 기능할 것으로 예측된 tracrRNA의 뉴클레오타이드 서열을 나타낸다.

[0033] 서열번호: 202, 203, 및 613-616은 MG34 뉴클레아제와 함께 기능할 것으로 예측된 예측된 단일 가이드 RNA(sgRNA) 서열의 뉴클레오타이드 서열을 보여준다. "N"은 가변 잔기를 나타내고 비-N-잔기는 스캐폴드 서열을 나타낸다.

[0034] **MG35 뉴클레아제**

[0035] 서열번호: 25-198, 221-459, 489-580, 및 617-668은 MG35 뉴클레아제의 전장 펩타이드 서열을 나타낸다.

[0036] 서열번호: 460-461은 MG35 뉴클레아제와 동일한 유전자좌로부터 유래된 MG35 tracrRNA의 뉴클레오타이드 서열을 나타낸다.

[0037] 서열번호: 462는 본원에 기재된 MG35 뉴클레아제의 반복을 나타낸다.

[0038] **MG102 뉴클레아제**

[0039] 서열번호: 581-612는 MG102 뉴클레아제의 전장 펩타이드 서열을 나타낸다.

[0040] 서열번호: 672-673은 MG102 뉴클레아제와 동일한 유전자좌로부터 유래된 MG102 tracrRNA의 뉴클레오타이드 서열을 나타낸다.

[0041] 서열번호: 205-220은 본 개시내용에 따라 뉴클레아제에 부가될 수 있는 예시적인 핵 위치화 서열(NLS)의 서열을 나타낸다.

[0042] **상세한 설명**

[0043] 본 개시내용의 다양한 구현예가 본원에 도시되고 설명되었지만, 그러한 구현예는 단지 예로서 제공된다는 것이 당업자에게 명백할 것이다. 수많은 변형, 변화 및 치환이 본 개시내용을 벗어나지 않고 당업자에게 일어날 수 있다. 본원에 기재된 발명의 구현예에 대한 다양한 대안이 이용될 수 있는 것으로 이해되어야 한다.

[0044] 본원에 개시된 일부 방법의 실시는 달리 지시되지 않는 한, 면역학, 생화학, 화학, 분자 생물학, 미생물학, 세포 생물학, 유전체학 및 재조합 DNA의 기술을 이용한다. 예를 들어 문헌[Sambrook and Green, Molecular Cloning: A Laboratory Manual, 4th Edition (2012); the series Current Protocols in Molecular Biology (F. M. Ausubel, et al. eds.); the series Methods In Enzymology (Academic Press, Inc.), PCR 2: A Practical Approach (M.J. MacPherson, B.D. Hames and G.R. Taylor eds. (1995)), Harlow and Lane, eds. (1988) Antibodies, A Laboratory Manual, and Culture of Animal Cells: A Manual of Basic Technique and Specialized Applications, 6th Edition (R.I. Freshney, ed. (2010))](이는 전체적으로 본원에 참고로

포함됨)을 참고한다.

[0045] 본원에 사용된 바와 같이, 단수 형태 "a", "an" 및 "the"는 문맥이 명백하게 달리 나타내지 않는 한 복수 형태도 포함하는 것으로 의도된다. 또한, 용어 "포함하는", "포함하다", "갖는" , "갖다" 또는 이들의 변형이 상세한 설명 및/또는 청구범위에서 사용되는 경우, 이러한 용어는 용어 "포함하는"과 유사한 방식으로 포괄적인 것으로 의도된다.

[0046] 용어 "약" 및 "대략"은 당업자에 의해 결정된 바와 같은 특정 값에 대한 허용가능한 오차 범위 내를 의미하며, 이는 값이 측정 또는 결정되는 방법, 즉 측정 시스템의 한계에 일부 좌우될 것이다. 예를 들어, "약"은 당업계의 관행에 따라 1 이상의 표준 편차 이내를 의미할 수 있다. 대안적으로, “약” 은 주어진 값의 최대 20%, 최대 15%, 최대 10%, 최대 5% 또는 최대 1%의 범위를 의미할 수 있다.

[0047] 본원에 사용된 바와 같이, "세포"는 일반적으로 생물학적 세포를 지칭한다. 세포는 살아있는 유기체의 기본적인 구조적, 기능적 및/또는 생물학적 단위일 수 있다. 세포는 하나 이상의 세포를 갖는 임의의 유기체로부터 기원할 수 있다. 일부 비제한적인 예는 원핵 세포, 진핵 세포, 박테리아 세포, 고세균 세포, 단일 세포 진핵 유기체의 세포, 원생동물 세포, 식물로부터의 세포(예컨대, 식물 작물, 과일, 채소, 곡물, 콩, 옥수수, 밀, 종자, 토마토, 쌀, 카사바, 사탕수수, 호박, 건초, 감자, 목화, 대마초, 담배, 개화 식물, 침엽수, 겉씨식물, 양치식물, 석송, 붕어마름, 우산이끼, 이끼로부터의 세포), 조류 세포(예컨대, 보트리오코커스 브라우니(Botryococcus braunii), 클라미도모나스 라인하르티이(Chlamydomonas reinhardtii), 난노클로롭시스 가디타나(Nannochloropsis gaditana), 클로렐라 피레노이도사(Chlorella pyrenoidosa), 사르가썸 파텐스 C. 아가르드(Sargassum patens C. Agardh) 등), 해조류(예컨대, 켈프), 곰팡이 세포(예컨대, 효모 세포, 버섯으로부터의 세포), 동물 세포, 무척추 동물(예컨대, 초파리, 자포류(cnidarian), 극피동물(echinoderm), 선충류(nematode) 등)로부터의 세포, 척추 동물(예컨대, 어류, 양서류, 파충류, 조류, 포유동물)로부터의 세포, 포유동물(예컨대, 돼지, 소, 염소, 양, 설치류, 래트, 마우스, 비인간 영장류, 인간 등)로부터의 세포 등을 포함한다. 때때로 세포는 천연 유기체로부터 기원하지 않는다(예컨대, 세포는 합성적으로 만들어질 수 있으며, 때로는 인공 세포로 불림).

[0048] 본원에 사용된 바와 같이, 용어 "뉴클레오타이드"는 일반적으로 염기-당-포스페이트 조합을 지칭한다. 뉴클레오타이드는 합성 뉴클레오타이드를 포함할 수 있다. 뉴클레오타이드는 합성 뉴클레오타이드 유사체를 포함할 수 있다. 뉴클레오타이드는 핵산 서열의 단량체 단위(예컨대, 데옥시리보핵산(DNA) 및 리보핵산(RNA))일 수 있다. 용어 뉴클레오타이드는 리보뉴클레오사이드 트리포스페이트 아데노신 트리포스페이트(ATP), 우리딘 트리포스페이트(UTP), 시토신 트리포스페이트(CTP), 구아노신 트리포스페이트(GTP) 및 데옥시리보뉴클레오사이드 트리포스페이트, 예컨대, dATP, dCTP, dITP, dUTP, dGTP, dTTP 또는 이들의 유도체를 포함할 수 있다. 이러한 유도체는 예를 들어, [αS]dATP, 7-데아자-dGTP 및 7-데아자-dATP, 및 이를 함유하는 핵산 분자에 뉴클레아제 내성을 부여하는 뉴클레오타이드 유도체를 포함할 수 있다. 본원에 사용된 바와 같이 용어 뉴클레오타이드는 디데옥시리보뉴클레오사이드 트리포스페이트(ddNTP) 및 이들의 유도체를 지칭할 수 있다. 디데옥시리보뉴클레오사이드 트리포스페이트의 예시적인 예는 비제한적으로 ddATP, ddCTP, ddGTP, ddITP, 및 ddTTP를 포함할 수 있다. 뉴클레오타이드는 표지되지 않거나 광학적으로 검출가능한 모이어티(예컨대, 형광단)를 포함하는 모이어티를 사용하는 것과 같이 검출가능하게 표지될 수 있다. 표지화는 또한 양자점을 이용하여 수행될 수 있다. 검출가능한 표지는 예를 들어, 방사성 동위원소, 형광 표지, 화학발광 표지, 생체발광 표지 및 효소 표지를 포함할 수 있다. 뉴클레오타이드의 형광 표지는 비제한적으로 플루오레세인, 5-카르복시플루오레세인(FAM), 2'7'-디메톡시-4'5-디클로로-6-카르복시플루오레세인(JOE), 로다민, 6-카르복시로다민(R6G), N,N,N',N'-테트라메틸-6-카르복시로다민(TAMRA), 6-카르복시-X-로다민(ROX), 4-(4'디메틸아미노페닐아조)벤조산(DABCYL), 캐스케이드 블루, 오레곤 그린, 텍사스 레드, 시아닌 및 5-(2'-아미노에틸)아미노나프탈렌-1-설폰산(EDANS)을 포함할 수 있다. 형광 표지된 뉴클레오타이드의 구체적인 예는 Perkin Elmer, Foster City, Calif로부터 이용가능한 [R6G]dUTP, [TAMRA]dUTP, [R110]dCTP, [R6G]dCTP, [TAMRA]dCTP, [JOE]ddATP, [R6G]ddATP, [FAM]ddCTP, [R110]ddCTP, [TAMRA]ddGTP, [ROX]ddTTP, [dR6G]ddATP, [dR110]ddCTP, [dTAMRA]ddGTP, 및 [dROX]ddTTP; Amersham, Arlington Heights, Ill.로부터 이용가능한 FluoroLink 데옥시뉴클레오타이드, FluoroLink Cy3-dCTP, FluoroLink Cy5-dCTP, FluoroLink FLuor X-dCTP, FluoroLink Cy3-dUTP, 및 FluoroLink Cy5-dUTP; Boehringer Mannheim, Indianapolis, Ind.로부터 이용가능한 플루오레세인-15-dATP, 플루오레세인-12-dUTP, 테트라메틸-로다민-6-dUTP, IR770-9-dATP, 플루오레세인-12-ddUTP, 플루오레세인-12-UTP, 및 플루오레세인-15-2'-dATP; 및 Molecular Probes, Eugene, Oreg로부터 이용가능한 염색체 표지된 뉴클레오타이드, BODIPY-FL-14-UTP, BODIPY-FL-4-UTP, BODIPY-TMR-14-UTP, BODIPY-TMR-14-UTP, BODIPY-TMR-14-DUTP, BODIPY-TR-14-UTP, BODIPY-TR-14-

dUTP, 캐스케이드 블루-7-UTP, 캐스케이드 블루-7-dUTP, 플루오레세인-12-UTP, 플루오레세인-12-dUTP, 오레곤 그린 488-5-dUTP, 로다민 그린-5-UTP, 로다민 그린-5-dUTP, 테트라메틸로다민-6-UTP, 테트라메틸로다민-6-dUTP, 텍사스 레드-5-UTP, 텍사스 레드-5-dUTP, 텍사스 레드-5-dUTP 및 텍사스 레드-12-dUTP를 포함할 수 있다. 뉴클레오타이드는 또한 화학적 변형에 의해 표지되거나 마킹될 수 있다. 화학적으로 변형된 단일 뉴클레오타이드는 바이오틴-dNTP일 수 있다. 바이오티닐화된 dNTP의 일부 비제한적 예는, 바이오틴-dATP(예컨대, 바이오-N6-ddATP, 바이오틴-14-dATP), 바이오틴-dCTP(예컨대, 바이오틴-11-dCTP, 바이오틴-14-dCTP), 및 바이오틴-dUTP(예컨대, 바이오틴-11-dUTP, 바이오틴-16-dUTP, 바이오틴-20-dUTP)를 포함할 수 있다. 뉴클레오타이드는 뉴클레오타이드 유사체를 포함할 수 있다. 일부 구현예에서, 뉴클레오타이드 유사체는 뉴클레오타이드의 특정 화학적 특성을 변경하지만 그의 의도된 기능(예컨대, RNA 또는 DNA에서 다른 뉴클레오타이드에 혼성화)을 수행하는 뉴클레오타이드 유사체의 능력을 보유하도록 임의의 위치에서 변형된 천연 뉴클레오타이드의 구조를 포함할 수 있다. 유도체화될 수 있는 뉴클레오타이드의 위치의 예는 5-위치, 예컨대, 5-(2-아미노)프로필 우리딘, 5-브로모 우리딘, 5-프로핀 우리딘, 5-프로페닐 우리딘 등; 6 위치, 예컨대, 6-(2-아미노)프로필 우리딘; 아데노신 및/또는 구아노신에 대한 8-위치, 예컨대, 8-브로모 구아노신, 8-클로로 구아노신, 8-플루오로구아노신 등을 포함한다. 뉴클레오타이드 유사체는 또한 데아자 뉴클레오타이드, 예컨대, 7-데아자-아데노신: O- 및 N-변형된(예컨대, 알킬화된, 예컨대, N6-메틸 아데노신, 또는 당업계에 달리 공지된 바와 같은) 뉴클레오타이드; 및 다른 헤테로사이클릭 변형된 뉴클레오타이드 유사체, 예컨대, 문헌[Herdewijn, Antisense Nucleic Acid Drug Dev., 2000 Aug. 10(4):297-310]에 기재된 것을 포함한다. 뉴클레오타이드 유사체는 또한 뉴클레오타이드의 당 부분에 대한 변형을 포함할 수 있다. 예를 들어, 2' OH 기는 H, OR, R, F, Cl, Br, I, SH, SR, NH2, NHR, NR2, COOR, 또는 OR로부터 선택된 기로 대체될 수 있으며, 여기서 R은 치환되거나 비치환된 C1-C6 알킬, 알케닐, 알키닐, 아릴 등이다. 다른 가능한 변형은 미국 특허 제5,858,988호 및 제6,291,438호에 기재된 것을 포함한다. 유도체화될 수 있는 뉴클레오타이드의 위치의 예는 5-위치, 예컨대, 5-(2-아미노)프로필 우리딘, 5-브로모 우리딘, 5-프로핀 우리딘, 5-프로페닐 우리딘 등; 6 위치, 예컨대, 6-(2-아미노)프로필 우리딘; 아데노신 및/또는 구아노신에 대한 8-위치, 예컨대, 8-브로모 구아노신, 8-클로로 구아노신, 8-플루오로구아노신 등을 포함한다. 뉴클레오타이드 유사체는 또한 데아자 뉴클레오타이드, 예컨대, 7-데아자-아데노신: O- 및 N-변형된(예컨대, 알킬화된, 예컨대, N6-메틸 아데노신, 또는 당업계에 달리 공지된 바와 같은) 뉴클레오타이드; 및 다른 헤테로사이클릭 변형된 뉴클레오타이드 유사체, 예컨대, 문헌[Herdewijn, Antisense Nucleic Acid Drug Dev., 2000 Aug. 10(4):297-310]에 기재된 것을 포함한다. 뉴클레오타이드 유사체는 또한 뉴클레오타이드의 당 부분에 대한 변형을 포함할 수 있다. 예를 들어, 2' OH 기는 H, OR, R, F, Cl, Br, I, SH, SR, NH2, NHR, NR2, COOR, 또는 OR로부터 선택된 기로 대체될 수 있으며, 여기서 R은 치환되거나 비치환된 C1-C6 알킬, 알케닐, 알키닐, 아릴 등이다. 다른 가능한 변형은 미국 특허 제5,858,988호 및 제6,291,438호에 기재된 것을 포함한다.

[0049] 용어 "폴리뉴클레오타이드", "올리고뉴클레오타이드" 및 "핵산"은 일반적으로 단일, 이중, 또는 다중 가닥 형태로 데옥시리보뉴클레오타이드 또는 리보뉴클레오타이드인 임의의 길이의 뉴클레오타이드의 중합체 형태, 또는 이의 유사체를 지칭하기 위해 상호교환가능하게 사용된다. 폴리뉴클레오타이드는 세포에 외인성 또는 내인성일 수 있다. 폴리뉴클레오타이드는 무세포 환경에 존재할 수 있다. 폴리뉴클레오타이드는 유전자 또는 그의 단편일 수 있다. 폴리뉴클레오타이드는 DNA일 수 있다. 폴리뉴클레오타이드는 RNA일 수 있다. 폴리뉴클레오타이드는 임의의 3차원 구조를 가질 수 있고, 임의의 기능을 수행할 수 있다. 폴리뉴클레오타이드는 하나 이상의 유사체(예컨대, 변경된 백본, 당, 또는 핵염기)를 포함할 수 있다. 존재하는 경우, 뉴클레오타이드 구조에 대한 변형은 중합체의 조립 전 또는 후에 부여될 수 있다. 유사체의 일부 비제한적 예는 5-브로모우라실, 펩타이드 핵산, 제노 핵산, 모르폴리노, 잠금 핵산, 글리콜 핵산, 트레오스 핵산, 디데옥시뉴클레오타이드, 코디세핀, 7-데아자-GTP, 형광단(예컨대, 당에 연결된 로다민 또는 플루오레세인), 티올 함유 뉴클레오타이드, 바이오틴 연결된 뉴클레오타이드, 형광 염기 유사체, CpG 섬, 메틸-7-구아노신, 메틸화된 뉴클레오타이드, 이노신, 티오우리딘, 슈도우리딘, 디하이드로우리딘, 퀘오신(queuosine), 및 와이오신(wyosine)을 포함한다. 폴리뉴클레오타이드의 비제한적 예는 유전자 또는 유전자 단편의 코딩 또는 비코딩 영역, 연결 분석으로부터 정의된 유전자좌, 엑손, 인트론, 메신저 RNA(mRNA), 운반 RNA(tRNA), 리보솜 RNA(rRNA), 짧은 간섭 RNA(siRNA), 짧은 헤어핀 RNA(shRNA), 마이크로-RNA(miRNA), 리보자임, cDNA, 재조합 폴리뉴클레오타이드, 분지형 폴리뉴클레오타이드, 플라스미드, 벡터, 임의의 서열의 단리된 DNA, 임의의 서열의 단리된 RNA, 무세포 DNA(cfDNA) 및 무세포 RNA(cfRNA)를 포함하는 무세포 폴리뉴클레오타이드, 핵산 프로브 및 프라이머를 포함한다. 뉴클레오타이드의 서열은 비뉴클레오타이드 구성요소에 의해 중단될 수 있다.

[0050] 용어 "형질감염" 또는 "형질감염된"은 일반적으로 비바이러스 또는 바이러스 기반 방법에 의한 세포 내로의 핵산의 도입을 지칭한다. 핵산 분자는 완전한 단백질 또는 이의 기능적 부분을 코딩하는 유전자 서열일 수 있다.

예컨대, 문헌[Sambrook et al., 1989, Molecular Cloning: A Laboratory Manual, 18.1-18.88(이는 전체적으로 본원에 참고로 포함됨)]을 참고한다.

[0051] 용어 "펩타이드", "폴리펩타이드" 및 "단백질"은 일반적으로 펩타이드 결합(들)에 의해 결합된 적어도 2개의 아미노산 잔기의 중합체를 지칭하기 위해 본원에서 상호교환가능하게 사용된다. 이 용어는 중합체의 특정 길이를 의미하지 않으며, 펩타이드가 재조합 기술, 화학적 또는 효소적 합성을 사용하여 생산되는지, 또는 자연적으로 발생하는지 여부를 암시하거나 구별하기 위한 것이 아니다. 용어는 자연 발생 아미노산 중합체뿐만 아니라 하나 이상의 변형된 아미노산을 포함하는 아미노산 중합체에 적용된다. 일부 경우에, 중합체는 비아미노산에 의해 중단될 수 있다. 상기 용어는 전장 단백질, 및 이차 및/또는 삼차 구조(예컨대, 도메인)를 갖거나 갖지 않는 단백질을 포함하는 임의의 길이의 아미노산 사슬을 포함한다. 상기 용어는 또한 예를 들어 디설파이드 결합 형성, 글리코실화, 지질화, 아세틸화, 인산화, 산화, 및 라벨링 성분과의 접합과 같은 임의의 다른 조작에 의해 변형된 아미노산 중합체를 포괄한다. 본원에 사용된 용어 "아미노산" 및 "아미노산들"은 일반적으로 비제한적으로 변형된 아미노산 및 아미노산 유사체를 포함하는 천연 및 비천연 아미노산을 지칭한다. 변형된 아미노산은 천연 아미노산 및 아미노산 상에 자연적으로 존재하지 않는 기 또는 화학적 모이어티를 포함하도록 화학적으로 변형된 비천연 아미노산을 포함할 수 있다. 아미노산 유사체는 아미노산 유도체를 지칭할 수 있다. 용어 "아미노산"은 D-아미노산 및 L-아미노산 모두를 포함한다.

[0052] 본원에 사용된 바와 같이, 용어 "비천연"은 일반적으로 천연 핵산 또는 단백질에서 발견되지 않는 핵산 또는 폴리펩타이드 서열을 지칭할 수 있다. 비천연은 친화도 태그를 지칭할 수 있다. 비천연은 융합을 지칭할 수 있다. 비천연은 돌연변이, 삽입 및/또는 결실을 포함하는 자연 발생 핵산 또는 폴리펩타이드 서열을 지칭할 수 있다. 비천연 서열은 또한 비천연 서열이 융합된 핵산 및/또는 폴리펩타이드 서열에 의해 나타날 수 있는 활성(예컨대, 효소 활성, 메틸트랜스퍼라제 활성, 아세틸트랜스퍼라제 활성, 키나제 활성, 유비퀴틴화 활성 등)을 나타내고/내거나 코딩할 수 있다. 비천연 핵산 또는 폴리펩타이드 서열은 유전 공학에 의해 자연 발생 핵산 또는 폴리펩타이드 서열(또는 이의 변이체)에 연결되어 키메라 핵산 및/또는 폴리펩타이드를 코딩하는 키메라 핵산 및/또는 폴리펩타이드 서열을 생성할 수 있다.

[0053] 본원에 사용된 용어 "프로모터"는 일반적으로 유전자의 전사 또는 발현을 제어하고, RNA 전사가 개시되는 뉴클레오타이드 또는 뉴클레오타이드의 영역에 인접하거나 중첩되어 위치할 수 있는 조절성 DNA 영역을 지칭한다. 프로모터는 RNA 중합효소가 DNA에 결합하여 유전자 전사를 야기하는 것을 촉진하는, 종종 전사 인자로 지칭되는 단백질 인자에 결합하는 특정 DNA 서열을 함유할 수 있다. '코어 프로모터'라고도 불리는 '기본 프로모터'는 일반적으로 작동가능하게 연결된 폴리뉴클레오타이드의 전사 발현을 촉진하기 위해 필요한 모든 기본 요소를 함유하는 프로모터를 지칭할 수 있다. 진핵 기본 프로모터는 전형적으로, 반드시 그렇지는 않지만, TATA-상자 및/또는 CAAT 상자를 함유한다.

[0054] 본원에 사용된 용어 "발현"은 일반적으로 핵산 서열 또는 폴리뉴클레오타이드가 DNA 주형으로부터 전사되는(예컨대, mRNA 또는 다른 RNA 전사체로) 과정 및/또는 전사된 mRNA가 후속적으로 펩타이드, 폴리펩타이드 또는 단백질로 번역되는 과정을 지칭한다. 전사체 및 코딩된 폴리펩타이드는 집합적으로 "유전자 산물"로 지칭될 수 있다. 폴리뉴클레오타이드가 게놈 DNA로부터 유래되는 경우, 발현은 진핵 세포에서 mRNA의 스플라이싱을 포함할 수 있다.

[0055] 본원에 사용된 바와 같이, "작동가능하게 연결된", "작동가능한 연결", "작동적으로 연결된" 또는 이의 문법적 등가물은 일반적으로 유전 요소들, 예컨대, 프로모터, 인핸서, 폴리아데닐화 서열 등의 병치를 지칭하며, 여기서 상기 요소들은 이들이 예상된 방식으로 작동하게 하는 관계에 있다. 예를 들어, 프로모터 및/또는 인핸서 서열을 포함할 수 있는 조절 요소는 조절 요소가 코딩 서열의 전사를 개시하는 것을 돕는 경우 코딩 영역에 작동가능하게 연결된다. 이러한 기능적 관계가 유지되는 한 조절 요소와 코딩 영역 사이에 개재하는 잔기가 존재할 수 있다.

[0056] 본원에 사용된 "벡터"는 일반적으로 폴리뉴클레오타이드를 포함하거나 이와 회합하고 폴리뉴클레오타이드를 세포에 전달하는 것을 매개하는 데 사용될 수 있는 거대분자 또는 거대분자들의 회합을 지칭한다. 벡터의 예는 플라스미드, 바이러스 벡터, 리포솜, 및 다른 유전자 전달 비히클을 포함한다. 벡터는 일반적으로 유전적 요소, 예컨대, 표적에서 유전자의 발현을 용이하게 하기 위해 유전자에 작동가능하게 연결된 조절 요소를 포함한다.

[0057] 본원에 사용된 바와 같이, "발현 카세트" 및 "핵산 카세트"는 일반적으로 함께 발현되거나 발현을 위해 작동가능하게 연결된 핵산 서열 또는 요소의 조합을 지칭하기 위해 상호교환가능하게 사용된다. 일부 경우에, 발현 카세트는 조절 요소와 이들이 발현을 위해 작동가능하게 연결된 유전자 또는 유전자들의 조합을 지칭한다.

[0058] DNA 또는 단백질 서열의 "기능적 단편"은 일반적으로 전장 DNA 또는 단백질 서열의 생물학적 활성과 실질적으로 유사한 생물학적 활성(기능적 또는 구조적)을 보유하는 단편을 지칭한다. DNA 서열의 생물학적 활성은 전장 서열에 기인하는 것으로 알려진 방식으로 발현에 영향을 미치는 그의 능력일 수 있다.

[0059] 본원에 사용된 바와 같이, "조작된" 대상은 일반적으로 대상이 인간 개입에 의해 변형되었음을 나타낸다. 비제한적인 예에 따르면, 핵산은 그의 서열을 자연에서 발생하지 않는 서열로 변경함으로써 변형될 수 있고; 핵산은 라이게이션된 산물이 원래의 핵산에 존재하지 않는 기능을 갖도록 이를 자연에서 회합하지 않는 핵산에 라이게이션함으로써 변형될 수 있고; 조작된 핵산은 자연에 존재하지 않는 서열과 함께 시험관내에서 합성될 수 있고; 단백질은 그의 아미노산 서열을 자연에 존재하지 않는 서열로 변경함으로써 변형될 수 있고; 조작된 단백질은 새로운 기능이나 특성을 획득할 수 있다. "조작된" 시스템은 적어도 하나의 조작된 구성요소를 포함한다.

[0060] 본원에 사용된 바와 같이, 용어 "최적으로 정렬된"은 일반적으로 가장 높은 퍼센트 동일성 스코어를 제공하거나 매치된 잔기의 수를 최대화하는 두 아미노산 서열의 정렬을 지칭한다.

[0061] 본원에 사용된 바와 같이, "합성" 및 "인공"은 자연 발생 인간 단백질에 대해 낮은 서열 동일성(예컨대, 50% 미만의 서열 동일성, 25% 미만의 서열 동일성, 10% 미만의 서열 동일성, 5% 미만의 서열 동일성, 1% 미만의 서열 동일성)을 갖는 단백질 또는 이의 도메인을 지칭하기 위해 상호교환가능하게 사용된다. 예를 들어, VPR 및 VP64 도메인은 합성 트랜스활성화 도메인이다.

[0062] 본원에 사용된 용어 "tracrRNA" 또는 "tracr 서열"은 일반적으로 야생형 예시적인 tracrRNA 서열(예컨대, *S. pyogenes S. aureus* 등으로부터의 tracrRNA, 또는 서열번호: 199-203)에 대해 적어도 약 5%, 10%, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, 95%, 또는 100% 서열 동일성 및/또는 서열 유사성을 갖는 핵산을 지칭할 수 있다. tracrRNA는 야생형 예시적인 tracrRNA 서열(예컨대, *S. pyogenes S. aureus* 등으로부터의 tracrRNA)에 대해 최대 약 5%, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, 또는 100% 서열 동일성 및/또는 서열 유사성을 갖는 핵산을 지칭할 수 있다. tracrRNA는 결실, 삽입, 또는 치환, 변이체, 돌연변이, 또는 키메라와 같은 뉴클레오타이드 변화를 포함할 수 있는 tracrRNA의 변형된 형태를 지칭할 수 있다. tracrRNA는 적어도 6개의 인접 뉴클레오타이드의 스트레치에 걸쳐 야생형 예시적인 tracrRNA(예컨대, *S. pyogenes S. aureus* 등으로부터의 tracrRNA) 서열과 적어도 약 60% 동일할 수 있는 핵산을 지칭할 수 있다. 예를 들어, tracrRNA 서열은 적어도 6개의 인접한 뉴클레오타이드의 스트레치에 걸쳐 적어도 약 60% 동일하거나, 적어도 약 65% 동일하거나, 적어도 약 70% 동일하거나, 적어도 약 75% 동일하거나, 적어도 약 80% 동일하거나, 적어도 약 85% 동일하거나, 적어도 약 90% 동일하거나, 적어도 약 95% 동일하거나, 적어도 약 98% 동일하거나, 적어도 약 99% 동일하거나, 100% 동일할 수 있다. 유형 II tracrRNA 서열은 인접한 CRISPR 어레이에서 반복 서열의 일부에 상보성을 갖는 영역을 확인함으로써 게놈 서열 상에서 예측될 수 있다.

[0063] 본원에 사용된 바와 같이, "가이드 핵산"은 일반적으로 또 다른 핵산에 혼성화할 수 있는 핵산을 지칭할 수 있다. 가이드 핵산은 RNA일 수 있다. 가이드 핵산은 DNA일 수 있다. 가이드 핵산은 핵산의 서열에 부위 특이적으로 결합하도록 프로그래밍될 수 있다. 표적화될 핵산, 또는 표적 핵산은 뉴클레오타이드를 포함할 수 있다. 가이드 핵산은 뉴클레오타이드를 포함할 수 있다. 표적 핵산의 일부는 가이드 핵산의 일부에 상보적일 수 있다. 가이드 핵산에 상보적이고 이와 혼성화하는 이중 가닥 표적 폴리뉴클레오타이드의 가닥은 상보적 가닥으로 불릴 수 있다. 상보적 가닥에 상보적이며, 따라서 가이드 핵산에 상보적이지 않을 수 있는 이중 가닥 표적 폴리뉴클레오타이드의 가닥은 비상보적 가닥으로 불릴 수 있다. 가이드 핵산은 폴리뉴클레오타이드 사슬을 포함할 수 있고, "단일 가이드 핵산"으로 불릴 수 있다. 가이드 핵산은 2개의 폴리뉴클레오타이드 사슬을 포함할 수 있고, "이중 가이드 핵산"으로 불릴 수 있다. 달리 특정되지 않으면, 용어 "가이드 핵산"은 단일 가이드 핵산 및 이중 가이드 핵산 모두를 지칭하여 포괄적일 수 있다. 가이드 핵산은 "핵산 표적화 분절" 또는 "핵산 표적화 서열"로 지칭될 수 있는 분절을 포함할 수 있다. 핵산 표적화 분절은 "단백질 결합 분절" 또는 "단백질 결합 서열" 또는 "Cas 단백질 결합 분절"로 지칭될 수 있는 서브분절을 포함할 수 있다.

[0064] 용어 "서열 동일성" 또는 "퍼센트 동일성"은 둘 이상의 핵산 또는 폴리펩타이드 서열의 문맥에서, 일반적으로 서열 비교 알고리즘을 사용하여 측정되는 바와 같이, 국소 또는 전체 비교 윈도우에 걸쳐 최대 대응을 위해 비교되고 정렬될 때, 동일하거나 동일한 아미노산 잔기 또는 뉴클레오타이드의 특정 백분율을 갖는 2개(예컨대, 쌍별 정렬에서) 또는 그 초과의(예컨대, 다중 서열 정렬에서) 서열을 지칭한다. 폴리펩타이드 서열에 적합한 서열 비교 알고리즘은, 예컨대, 3의 단어길이(W), 10의 기대값(E), 및 11의 존재, 1의 확장에서 갭 비용을 설정하는 BLOSUM62 스코어링 매트릭스의 파라미터, 및 30개 잔기보다 긴 폴리펩타이드 서열에 대한 조건부 구성 스코어 매트릭스 조정을 사용하는 BLASTP; 2의 단어길이(W), 1000000의 기대값(E)의 파라미터를 사용하는 BLASTP,

및 30개 미만의 잔기의 서열에 대해 갭을 열기 위해 9 및 갭을 확장하기 위해 1에서 갭 비용을 설정하는 PAM30 (이들은 https://blast.ncbi.nlm.nih.gov에서 이용가능한 BLAST 세트 내의 BLASTP에 대한 기본 매개변수임); 또는 2의 매치, -1의 미스매치 및 -1의 갭의 파라미터와 함께 스미스-워터맨 상동성 검색 알고리즘의 파라미터를 갖는 CLISTALW; 기본 매개변수를 갖는 MUSCLE; 매개변수 2의 리트리(retree) 및 1000의 최대반복을 갖는 MAFFT; 기본 매개변수를 갖는 Novafold; 기본 매개변수를 갖는 HMMER hmmalign를 포함한다.

[0065] 본원에 사용된 바와 같이, 용어 "RuvC_III 도메인"은 일반적으로 RuvC 엔도뉴클레아제 도메인의 3번째 불연속 분절을 지칭한다(RuvC 뉴클레아제 도메인은 3개의 인접하지 않은 분절, RuvC_I, RuvC_II, 및 RuvC_III로 구성됨). RuvC 도메인 또는 그의 분절(예컨대, RuvC_I, RuvC_II, 또는 RuvC_III)은 일반적으로 공지된 도메인 서열에 대한 정렬, 주석이 달린 도메인을 갖는 단백질에 대한 구조적 정렬, 또는 공지된 도메인 서열(예컨대, RuvC_III에 대한 Pfam HMM PF18541)에 기초하여 구축된 히든 마르코프 모델(HMM)과 비교함으로써 확인될 수 있다.

[0066] 본원에 사용된 바와 같이, 용어 "HNH 도메인"은 일반적으로 특징적인 히스티딘 및 아스파라긴 잔기를 갖는 엔도뉴클레아제 도메인을 지칭한다. HNH 도메인은 일반적으로 공지된 도메인 서열에 대한 정렬, 주석이 달린 도메인을 갖는 단백질에 대한 구조적 정렬, 또는 공지된 도메인 서열(예컨대, 도메인 HNH에 대한 Pfam HMM PF01844)에 기초하여 구축된 히든 마르코프 모델(HMM)과 비교함으로써 확인될 수 있다.

[0067] 본원에 사용된 바와 같이, 용어 "브릿지 나선 도메인" 또는 "BH 도메인"은 일반적으로 표적 DNA의 결합시 절단 활성을 개시하는 데 중요한 역할을 하는 Cas 효소에 존재하는 아르기닌 풍부 나선 도메인을 지칭한다.

[0068] 본원에 사용된 바와 같이, 용어 "인식 도메인" 또는 "REC 도메인"은 일반적으로 gRNA의 반복:항-반복 듀플렉스와 상호작용하고 Cas 엔도뉴클레아제/gRNA 복합체의 형성을 매개하는 것으로 생각되는 도메인을 지칭한다.

[0069] 본원에 사용된 바와 같이, 용어 "웨지 도메인" 또는 "WED 도메인"은 일반적으로 4개의 알파 나선에 의해 측접된 비틀린 5가닥 베타 시트를 포함하는 폴드를 지칭하며, 이는 일반적으로 Cas 효소에 대한 왜곡된 반복:항-반복 듀플렉스의 인식을 담당한다. WED 도메인은 단일-가이드 RNA 스캐폴드의 인식을 담당할 수 있다.

[0070] 본원에 사용된 바와 같이, 용어 "PAM 상호작용 도메인" 또는 "PI 도메인"은 일반적으로 가이드 RNA의 비상보적 DNA 가닥 상의 PAM 서열을 인식하는 엔도뉴클레아제-DNA 복합체에 위치하는 Cas 효소에서 발견되는 도메인을 지칭한다.

[0071] *개요*

[0072] 고유한 기능성 및 구조를 갖는 새로운 Cas 효소의 발견은 데옥시리보핵산(DNA) 에디팅 기술을 더 방해하여, 속도, 특이성, 기능성 및 사용 편의성을 개선하는 잠재력을 제공할 수 있다. 미생물에서의 CRISPR(Clustered Regularly Interspaced Short Palindromic Repeats) 시스템의 예측된 유행 및 미생물 종의 순전한 다양성에 비해, 비교적 적은 기능적으로 특징화된 CRISPR/Cas 효소가 문헌에 존재한다. 이것은 부분적으로 엄청난 수의 미생물 종이 실험실 조건에서 쉽게 배양되지 않을 수 있기 때문이다. 많은 수의 미생물 종을 대표하는 자연 환경적 적소(niche)로부터의 메타게놈 시퀀싱은 알려진 새로운 CRISPR/Cas 시스템의 수를 대폭 증가시키고 새로운 올리고뉴클레오타이드 에디팅 기능성의 발견을 가속화하는 잠재력을 제공할 수 있다. 이러한 접근법의 결실에 대한 최근의 예는 천연 미생물 군집의 메타게놈 분석으로부터 CasX/CasY CRISPR 시스템의 2016년 발견에 의해 입증된다.

[0073] CRISPR/Cas 시스템은 미생물에서 적응성 면역 체계로서 기능하는 것으로 설명된 RNA 지시 뉴클레아제 복합체이다. 그들의 자연적인 문맥에서, CRISPR/Cas 시스템은 CRISPR(clustered regularly interspaced short palindromic repeats) 오페론 또는 유전자좌에서 발생하며, 이는 일반적으로 두 부분인 (i) RNA 기반 표적화 요소를 코딩하는 동등하게 짧은 스페이서 서열에 의해 분리된 짧은 반복 서열(30-40 bp)의 어레이; 및 (ii) 부속 단백질/효소와 함께 RNA 기반 표적화 요소에 의해 지시된 뉴클레아제 폴리펩타이드를 코딩하는 Cas를 코딩하는 ORF를 포함한다. 특정 표적 핵산 서열의 효율적인 뉴클레아제 표적화는 일반적으로 (i) 표적의 처음 6-8개 핵산(표적 시드)과 crRNA 가이드 사이의 상보적인 혼성화; 및 (ii) 표적 시드의 정의된 부근 내에 프로토스페이서-인접 모티프(PAM) 서열의 존재(PAM은 일반적으로 숙주 게놈 내에서 일반적으로 나타나지 않는 서열임) 모두를 필요로 한다. 시스템의 정확한 기능과 조직화에 따라, CRISPR-Cas 시스템은 일반적으로 공유된 기능적 특징과 진화 유사성을 기반으로 2개의 클래스, 5개의 유형 및 16개의 서브유형으로 조직화된다.

[0074] 클래스 I CRISPR-Cas 시스템은 큰 다중서브유닛 효과기 복합체를 가지며, 유형 I, III 및 IV를 포함한다.

[0075] 유형 I CRISPR-Cas 시스템은 구성요소의 측면에서 적당히 복잡한 것으로 간주된다. 유형 I CRISPR-Cas 시스템에서, RNA-표적화 요소의 어레이는 이들 다음에 프로토스페이서-인접 모티프(PAM)라고 불리는 적합한 짧은 공통 서열이 뒤따를 때 뉴클레아제 복합체를 핵산 표적으로 지시하는 짧고 성숙한 crRNA를 해방시키기 위해 반복 요소에서 처리되는 긴 전구체 crRNA(전-crRNA)로서 전사된다. 이러한 처리는 crRNA 지시 뉴클레아제 복합체의 뉴클레아제(Cas3) 단백질 성분을 또한 포함하는 캐스캐이드(Cascade)로 불리는 큰 엔도뉴클레아제 복합체의 엔도리보뉴클레아제 서브유닛(Cas6)을 통해 발생한다. Cas I 뉴클레아제는 주로 DNA 뉴클레아제로서 기능한다.

[0076] 유형 III CRISPR 시스템은 Csm 또는 Cmr 단백질 서브유닛을 포함하는 반복 연관된 신비한 단백질(RAMP) 옆에, Cas10으로 알려진 중앙 뉴클레아제의 존재를 특징으로 할 수 있다. 유형 I 시스템에서처럼, 성숙한 crRNA는 Cas6 유사 효소를 사용하여 전-crRNA로부터 처리된다. 유형 I 및 II 시스템과 달리, 유형 III 시스템은 DNA-RNA 듀플렉스(예컨대, RNA 중합효소에 대한 주형으로 사용되는 DNA 가닥)를 표적으로 하고 절단하는 것으로 보인다.

[0077] 유형 IV CRISPR-Cas 시스템은 매우 감소된 큰 서브유닛 뉴클레아제(csf1), Cas5(csf3) 및 Cas7(csf2) 그룹의 RAMP 단백질에 대한 2개의 유전자, 및 일부 경우에, 예측된 작은 서브유닛에 대한 유전자로 구성된 효과기 복합체를 보유하고; 이러한 시스템은 일반적으로 내인성 플라스미드에서 발견된다.

[0078] 클래스 II CRISPR-Cas 시스템은 일반적으로 단일 폴리펩타이드 다중도메인 뉴클레아제 효과기를 가지며, 유형 II, V 및 VI를 포함한다.

[0079] 유형 II CRISPR-Cas 시스템은 구성요소 측면에서 가장 단순한 것으로 간주된다. 유형 II CRISPR-Cas 시스템에서, 성숙한 crRNA로의 CRISPR 어레이의 처리는 특별한 엔도뉴클레아제 서브유닛의 존재를 필요로 하지 않고, 오히려 어레이 반복 서열에 상보적인 영역을 갖는 작은 트랜스-코딩된 crRNA(tracrRNA)를 필요로 하며; tracrRNA는 그의 상응하는 효과기 뉴클레아제(예컨대, Cas9) 및 반복 서열 둘 모두와 상호작용하여 전구체 dsRNA 구조를 형성하고, 이는 내인성 RNAse III에 의해 절단되어 tracrRNA 및 crRNA 모두가 로딩된 성숙한 효과기 효소를 생성한다. Cas II 뉴클레아제는 DNA 뉴클레아제로 알려져 있다. 유형 II 효과기는 일반적으로 RuvC 유사 뉴클레아제 도메인의 폴드 내에 삽입된 관련되지 않은 HNH 뉴클레아제 도메인과 함께 RNase H 폴드를 채택하는 RuvC 유사 엔도뉴클레아제 도메인으로 구성된 구조를 나타낸다. RuvC 유사 도메인은 표적(예컨대, crRNA 상보성) DNA 가닥의 절단을 담당하는 반면, HNH 도메인은 대체된 DNA 가닥의 절단을 담당한다.

[0080] 유형 V CRISPR-Cas 시스템은 RuvC 유사 도메인을 포함하여, 유형 II 효과기와 유사한 뉴클레아제 효과기(예컨대, Cas12) 구조를 특징으로 한다. 유형 II와 유사하게, 대부분(전부는 아님)의 유형 V CRISPR 시스템은 tracrRNA를 사용하여 전-crRNA를 성숙한 crRNA로 처리하지만, 전-crRNA를 다수의 crRNA로 절단하는 RNAse III를 필요로 하는 유형 II 시스템과는 달리, 유형 V 시스템은 효과기 뉴클레아제 자체를 사용하여 전-crRNA를 절단할 수 있다. 유형-II CRISPR-Cas 시스템과 마찬가지로, 유형 V CRISPR-Cas 시스템은 다시 DNA 뉴클레아제로 알려져 있다. 유형 II CRISPR-Cas 시스템과 달리, 일부 유형 V 효소(예컨대, Cas12a)는 이중 가닥 표적 서열의 첫 번째 crRNA 지시 절단에 의해 활성화되는 강력한 단일 가닥의 비특이적 데옥시리보뉴클레아제 활성을 갖는 것으로 보인다.

[0081] 유형 VI CRISPR-Cas 시스템은 RNA 가이드된 RNA 엔도뉴클레아제를 갖는다. RuvC 유사 도메인 대신에, 유형 VI 시스템(예컨대, Cas13)의 단일 폴리펩타이드 효과기는 2개의 HEPN 리보뉴클레아제 도메인을 포함한다. 유형 II 및 V 시스템 둘 모두와 상이하게, 유형 VI 시스템은 또한 전-crRNA를 crRNA로 처리하기 위해 tracrRNA를 필요로 하지 않는 것으로 보인다. 그러나, 유형 V 시스템과 유사하게, 일부 유형 VI 시스템(예컨대, C2C2)은 표적 RNA의 첫 번째 crRNA 지시된 절단에 의해 활성화된 강력한 단일 가닥의 비특이적 뉴클레아제(리보뉴클레아제) 활성을 보유하는 것으로 보인다.

[0082] 이들의 더 단순한 아키텍처 때문에, 클래스 II CRISPR-Cas는 디자이너 뉴클레아제/게놈 에디팅 애플리케이션으로서 조작 및 개발에 가장 널리 채택되어 왔다.

[0083] 시험관내 사용을 위한 이러한 시스템의 초기 각색 중 하나는 문헌[Jinek et al. (Science. 2012 Aug 17;337(6096):816-21, 전체적으로 본원에 참고로 포함됨)에서 찾을 수 있다. Jinek 연구는 처음으로 (i) *S. pyogenes* SF370으로부터 분리된 재조합으로 발현된 정제된 전장 Cas9(예컨대, 클래스 II, 유형 II Cas 효소), (ii) 절단되기를 원하는 표적 DNA 서열에 상보적인 ~20 nt 5' 서열 다음에 3' tracr-결합 서열을 갖는 정제된 성숙한 ~42 nt crRNA(전체 crRNA는 T7 프로모터 서열을 갖는 합성 DNA 주형으로부터 시험관내에서 전사됨); (iii) T7 프로모터 서열을 갖는 합성 DNA 주형으로부터 시험관내에서 전사된 정제된 tracrRNA, 및 (iv) Mg^{2+}를 포함하는 시스템을 기술하였다. Jinek은 이후 (ii)의 crRNA가 링커(예컨대, GAAA)에 의해 (iii)의 5' 말단에 연

결되어 Cas9를 그 자체로 표적으로 지시할 수 있는 단일 융합 합성 가이드 RNA(sgRNA)를 형성하는 개선된 조작된 시스템을 기술하였다(도 2의 상부 및 하부 패널 비교).

[0084] 본원에 전체적으로 참조로 포함된 Mali 등(Science. 2013 Feb 15; 339(6121): 823-826.)은 이후에 (i) C 말단 핵 위치화 서열(예컨대, SV40 NLS) 및 적합한 폴리아데닐화 신호(예컨대, 예컨대, TK pA 신호)와 함께 적합한 포유동물 프로모터 하에 코돈 최적화된 Cas9(예컨대, 클래스 II, 유형 II Cas 효소)를 코딩하는 ORF; 및 (ii) 적합한 중합효소 III 프로모터(예컨대, U6 프로모터) 하에 sgRNA(G로 시작하는 5' 서열 다음에 3' tracr-결합 서열, 링커 및 tracrRNA 서열에 결합된 20 nt의 상보적인 표적화 핵산 서열을 가짐)를 코딩하는 ORF를 코딩하는 DNA 벡터를 제공함으로써 포유동물 세포에서 사용하기 위해 이 시스템을 각색하였다.

[0085] *MG 효소*

[0086] 일 양태에서, 본 개시내용은 조작된 뉴클레아제 시스템을 제공한다. 조작된 뉴클레아제 시스템은 (a) 엔도뉴클레아제를 포함할 수 있다. 일부 경우에, 엔도뉴클레아제는 RuvC 도메인 및 HNH 도메인을 포함한다. 엔도뉴클레아제는 배양되지 않은 미생물로부터 유래될 수 있다. 엔도뉴클레아제는 Cas 엔도뉴클레아제일 수 있다. 엔도뉴클레아제는 클래스 2 엔도뉴클레아제일 수 있다. 엔도뉴클레아제는 클래스 2, 유형 II Cas 엔도뉴클레아제일 수 있다. 조작된 뉴클레아제 시스템은 (b) 조작된 가이드 리보핵산 구조체를 포함할 수 있다. 조작된 가이드 리보핵산 구조체는 엔도뉴클레아제와 복합체를 형성하도록 구성될 수 있다. 일부 경우에, 엔도뉴클레아제와 복합체를 형성하도록 구성된 조작된 가이드 리보핵산 구조체는 가이드 리보핵산 서열을 포함한다. 가이드 리보핵산 서열은 표적 데옥시리보핵산 서열에 혼성화하도록 구성될 수 있다. 일부 경우에, 엔도뉴클레아제와 복합체를 형성하도록 구성된 조작된 가이드 리보핵산 구조체는 tracr 리보핵산 서열을 포함한다. tracr 리보핵산 서열은 엔도뉴클레아제에 결합하도록 구성될 수 있다. 일부 경우에, 엔도뉴클레아제는 약 120 kDa 이하, 약 110 kDa 이하, 약 100 kDa 이하, 약 90 kDa 이하, 약 80 kDa 이하, 약 70 kDa 이하, 약 60 kDa 이하, 약 50 kDa 이하, 약 40 kDa 이하, 약 30 kDa 이하, 약 20 kDa 이하, 또는 약 10 kDa 이하의 분자량을 갖는다.

[0087] 일부 경우에, 엔도뉴클레아제는 서열번호:1-198, 221-459, 463-612, 또는 617-668 중 어느 하나에 대해 적어도 50%, 적어도 55%, 적어도 50%, 적어도 55%, 적어도 60%, 적어도 65%, 적어도 70%, 적어도 75%, 적어도 80%, 적어도 85%, 적어도 90%, 적어도 91%, 적어도 92%, 적어도 93%, 적어도 94%, 적어도 95%, 적어도 95%, 적어도 96%, 적어도 97%, 적어도 98%, 또는 적어도 99% 서열 동일성을 갖는 서열을 포함한다.

[0088] 일 양태에서, 본 개시내용은 조작된 뉴클레아제 시스템을 제공한다. 조작된 뉴클레아제 시스템은 (a) 엔도뉴클레아제를 포함할 수 있다. 엔도뉴클레아제는 RuvC-1 도메인 또는 RuvC 도메인을 포함할 수 있다. 엔도뉴클레아제는 HNH 도메인을 포함할 수 있다. 엔도뉴클레아제는 RuvC-1 도메인 및 HNH 도메인을 포함할 수 있다. 엔도뉴클레아제는 Cas 엔도뉴클레아제일 수 있다. 엔도뉴클레아제는 클래스 2 엔도뉴클레아제일 수 있다. 엔도뉴클레아제는 클래스 2, 유형 II Cas 엔도뉴클레아제일 수 있다. 조작된 뉴클레아제 시스템은 (b) 조작된 가이드 리보핵산을 포함할 수 있다. 조작된 가이드 리보핵산 구조체는 엔도뉴클레아제와 복합체를 형성하도록 구성될 수 있다. 엔도뉴클레아제와 복합체를 형성하도록 구성된 가이드 리보핵산 구조체는 가이드 리보핵산 서열을 포함할 수 있다. 가이드 리보핵산 서열은 표적 데옥시리보핵산 서열에 혼성화하도록 구성될 수 있다. 엔도뉴클레아제와 복합체를 형성하도록 구성된 조작된 가이드 리보핵산 구조체는 tracr 리보핵산 서열을 포함할 수 있다. tracr 리보핵산 서열은 엔도뉴클레아제에 결합하도록 구성될 수 있다. 엔도뉴클레아제는 1-198, 221-459, 463-612, 또는 617-668 중 어느 하나에 대해 적어도 50%, 적어도 55%, 적어도 50%, 적어도 55%, 적어도 60%, 적어도 65%, 적어도 70%, 적어도 75%, 적어도 80%, 적어도 81%, 적어도 82%, 적어도 83%, 적어도 84%, 적어도 85%, 적어도 86%, 적어도 87%, 적어도 88%, 적어도 89%, 적어도 90%, 적어도 91%, 적어도 92%, 적어도 93%, 적어도 94%, 적어도 95%, 적어도 96%, 적어도 97%, 적어도 98%, 또는 적어도 99% 서열 동일성을 갖는 서열을 포함할 수 있다. 엔도뉴클레아제는 고세균 엔도뉴클레아제일 수 있다. 엔도뉴클레아제는 클래스 2, 유형 II Cas 엔도뉴클레아제일 수 있다. 엔도뉴클레아제는 RRxRR 모티프를 포함하는 아르기닌 풍부 영역 또는 PF14239 상동성을 갖는 도메인을 포함할 수 있다. 아르기닌 풍부 영역 또는 PF14239 상동성을 갖는 도메인은 서열번호: 1-198, 221-459, 463-612 또는 617-668 중 어느 하나의 아르기닌 풍부 영역 또는 PF14239 상동성을 갖는 도메인에 대해 적어도 50%, 적어도 55%, 적어도 50%, 적어도 55%, 적어도 60%, 적어도 65%, 적어도 70%, 적어도 75%, 적어도 80%, 적어도 81%, 적어도 82%, 적어도 83%, 적어도 84%, 적어도 85%, 적어도 86%, 적어도 87%, 적어도 88%, 적어도 89%, 적어도 90%, 적어도 91%, 적어도 92%, 적어도 93%, 적어도 94%, 적어도 95%, 적어도 96%, 적어도 97%, 적어도 98%, 또는 적어도 99% 서열 동일성을 갖는 서열을 포함할 수 있다. 아르기닌 풍부 도메인 또는 PF14239 상동성을 갖는 도메인의 도메인 경계는 MG34-1 또는 MG34-9에 대한 최적 정렬에 의해 확인될 수 있다. 엔도뉴클레아제는 REC 도메인을 포함할 수 있다. REC 도메인은 서열번호: 1-198, 221-459, 463-612, 또는 617-668 중 어

느 하나의 REC 도메인에 대해 적어도 50%, 적어도 55%, 적어도 50%, 적어도 55%, 적어도 60%, 적어도 65%, 적어도 70%, 적어도 75%, 적어도 80%, 적어도 81%, 적어도 82%, 적어도 83%, 적어도 84%, 적어도 85%, 적어도 86%, 적어도 87%, 적어도 88%, 적어도 89%, 적어도 90%, 적어도 91%, 적어도 92%, 적어도 93%, 적어도 94%, 적어도 95%, 적어도 96%, 적어도 97%, 적어도 98%, 또는 적어도 99%의 서열 동일성을 갖는 서열을 포함할 수 있다. REC 도메인의 도메인 경계는 MG34-1 또는 MG34-9에 대한 최적 정렬에 의해 확인될 수 있다. 엔도뉴클레아제는 BH(Bridge Helix) 도메인을 포함할 수 있다. BH 도메인은 서열번호: 1-198, 221-459, 463-612, 또는 617-668 중 어느 하나의 BH 도메인에 대해 적어도 50%, 적어도 55%, 적어도 50%, 적어도 55%, 적어도 60%, 적어도 65%, 적어도 70%, 적어도 75%, 적어도 80%, 적어도 81%, 적어도 82%, 적어도 83%, 적어도 84%, 적어도 85%, 적어도 86%, 적어도 87%, 적어도 88%, 적어도 90%, 적어도 91%, 적어도 92%, 적어도 93%, 적어도 94%, 적어도 95%, 적어도 96%, 적어도 97%, 적어도 98%, 또는 적어도 99%의 서열 동일성을 갖는 서열을 포함할 수 있다. BH 도메인의 도메인 경계는 MG34-1 또는 MG34-9에 대한 최적 정렬에 의해 확인될 수 있다.

[0089] 엔도뉴클레아제는 WED(웨지) 도메인을 포함할 수 있다. WED 도메인은 서열번호: 1-198, 221-459, 463-612, 또는 617-668 중 어느 하나의 WED 도메인에 대해 적어도 50%, 적어도 55%, 적어도 50%, 적어도 55%, 적어도 60%, 적어도 65%, 적어도 70%, 적어도 75%, 적어도 80%, 적어도 81%, 적어도 82%, 적어도 83%, 적어도 84%, 적어도 85%, 적어도 86%, 적어도 87%, 적어도 88%, 적어도 90%, 적어도 91%, 적어도 92%, 적어도 93%, 적어도 94%, 적어도 95%, 적어도 96%, 적어도 97%, 적어도 98%, 또는 적어도 99%의 서열 동일성을 갖는 서열을 포함할 수 있다. WED 도메인의 도메인 경계는 MG34-1 또는 MG34-9에 대한 최적의 정렬에 의해 식별될 수 있다. 엔도뉴클레아제는 PI(PAM 상호작용) 도메인을 포함할 수 있다. PI 도메인은 서열번호: 1-198, 221-459, 463-612, 또는 617-668 중 어느 하나의 PI 도메인에 대해 적어도 50%, 적어도 55%, 적어도 50%, 적어도 55%, 적어도 60%, 적어도 65%, 적어도 70%, 적어도 75%, 적어도 80%, 적어도 81%, 적어도 82%, 적어도 83%, 적어도 84%, 적어도 85%, 적어도 86%, 적어도 87%, 적어도 88%, 적어도 90%, 적어도 91%, 적어도 92%, 적어도 93%, 적어도 94%, 적어도 95%, 적어도 96%, 적어도 97%, 적어도 98%, 또는 적어도 99%의 서열 동일성을 갖는 서열을 포함할 수 있다. PI 도메인의 도메인 경계는 MG34-1 또는 MG34-9에 대한 최적의 정렬에 의해 식별될 수 있다.

[0090] 일부 경우에, 엔도뉴클레아제는 배양되지 않은 미생물로부터 유래된다. 일부 경우에, tracr 리보핵산 서열은 서열번호: 199-200, 460-461, 또는 669-673 중 어느 하나로부터 적어도 50개, 적어도 60개, 적어도 70개, 적어도 80개의 연속적인 뉴클레오타이드에 대해 적어도 50%, 적어도 55%, 적어도 50%, 적어도 55%, 적어도 60%, 적어도 65%, 적어도 70%, 적어도 75%, 적어도 80%, 적어도 85%, 적어도 90%, 적어도 91%, 적어도 92%, 적어도 93%, 적어도 94%, 적어도 95%, 적어도 96%, 적어도 97%, 적어도 98%, 또는 적어도 99%의 서열 동일성을 갖는 서열, 또는 서열번호: 201-203 또는 613-616 중 어느 하나의 비가변 뉴클레오타이드의 적어도 50개, 적어도 60개, 적어도 70개, 적어도 80개의 연속적인 뉴클레오타이드에 대해 적어도 50%, 적어도 55%, 적어도 60%, 적어도 65%, 적어도 70%, 적어도 75%, 적어도 80%, 적어도 85%, 적어도 90%, 적어도 91%, 적어도 92%, 적어도 93%, 적어도 94%, 적어도 95%, 적어도 96%, 적어도 97%, 적어도 98%, 또는 적어도 99%의 서열 동일성을 갖는 서열을 포함한다.

[0091] 일부 경우에, 가이드 핵산 구조체는 서열번호: 201을 포함한다. 일부 경우에, 가이드 핵산 구조체는 서열번호: 202를 포함한다. 일부 경우에, 가이드 핵산 구조체는 서열번호: 203을 포함한다. 일부 경우에, 가이드 핵산 구조체는 서열번호: 201-203을 포함한다. 일부 경우에, 가이드 핵산 구조체는 서열번호: 613을 포함한다. 일부 경우에, 가이드 핵산 구조체는 서열번호: 614를 포함한다. 일부 경우에, 가이드 핵산 구조체는 서열번호: 615를 포함한다. 일부 경우에, 가이드 핵산 구조체는 서열번호: 616을 포함한다.

[0092] 일 양태에서, 본 개시내용은 조작된 뉴클레아제 시스템을 제공한다. 조작된 뉴클레아제 시스템은 (a) 조작된 가이드 리보핵산 구조체를 포함할 수 있다. 조작된 가이드 리보핵산 구조체는 가이드 리보핵산 서열을 포함할 수 있다. 가이드 리보핵산 서열은 표적 데옥시리보핵산 서열에 혼성화하도록 구성될 수 있다. 조작된 가이드 리보핵산 구조체는 tracr 리보핵산 서열을 포함할 수 있다. tracr 리보핵산 서열은 엔도뉴클레아제에 결합하도록 구성될 수 있다. 일부 경우에, tracr 리보핵산 서열은 서열번호: 199-200, 460-461, 또는 669-673 중 어느 하나로부터 적어도 50개, 적어도 60개, 적어도 70개, 적어도 80개의 연속적인 뉴클레오타이드에 대해 적어도 50%, 적어도 55%, 적어도 50%, 적어도 55%, 적어도 60%, 적어도 65%, 적어도 70%, 적어도 75%, 적어도 80%, 적어도 85%, 적어도 90%, 적어도 91%, 적어도 92%, 적어도 93%, 적어도 94%, 적어도 95%, 적어도 96%, 적어도 97%, 적어도 98%, 또는 적어도 99% 서열 동일성을 갖는 서열, 또는 서열번호: 201-203 또는 613-616 중 어느 하나의 비가변 뉴클레오타이드의 적어도 15개, 적어도 20개, 적어도 25개, 적어도 30개, 적어도 35개, 적어도 40개, 적어도 45개, 적어도 50개, 적어도 60개, 적어도 70개, 적어도 80개의 연속적인 뉴클레오타이드에 대해 적어도 50%,

적어도 55%, 적어도 60%, 적어도 65%, 적어도 70%, 적어도 75%, 적어도 80%, 적어도 85%, 적어도 90%, 적어도 91%, 적어도 92%, 적어도 93%, 적어도 94%, 적어도 95%, 적어도 96%, 적어도 97%, 적어도 98%, 또는 적어도 99%의 서열 동일성을 갖는 서열을 포함한다.

[0093] 일부 경우에, 조작된 뉴클레아제 시스템은 엔도뉴클레아제를 포함한다. 엔도뉴클레아제는 클래스 2 엔도뉴클레아제일 수 있다. 엔도뉴클레아제는 Cas 엔도뉴클레아제일 수 있다. 엔도뉴클레아제는 클래스 2, 유형 II Cas 엔도뉴클레아제일 수 있다.

[0094] 일부 경우에, 엔도뉴클레아제는 특정 분자량 범위를 갖는다. 일부 구현예에서, 엔도뉴클레아제는 약 120 kDa 이하, 약 110 kDa 이하, 약 105 kDa 이하, 약 100 kDa 이하, 약 95 kDa 이하, 약 90 kDa 이하, 약 95 kDa 이하, 약 80 kDa 이하, 약 75 kDa 이하, 약 70 kDa 이하, 약 65 kDa 이하, 약 60 kDa 이하, 약 55 kDa 이하, 약 50 kDa 이하, 약 45 kDa 이하, 약 40 kDa 이하, 약 35 kDa 이하, 약 30 kDa 이하, 약 25 kDa 이하, 약 20 kDa 이하, 약 15 kDa 이하, 또는 약 10 kDa 이하의 분자량을 갖는다. 일부 경우에, 조작된 가이드 리보핵산 구조체는 적어도 2개의 리보핵산 폴리뉴클레오타이드를 포함한다. 일부 경우에, 엔도뉴클레아제는 특정 수의 잔기를 포함한다. 엔도뉴클레아제는 약 1,100개 이하의 잔기, 약 1,000개 이하의 잔기, 약 950개 이하의 잔기, 약 900개 이하의 잔기, 약 850개 이하의 잔기, 약 800개 이하의 잔기, 약 750개 이하의 잔기, 약 700개 이하의 잔기, 약 650개 이하의 잔기, 약 600개 이하의 잔기, 약 550개 이하의 잔기, 약 500개 이하의 잔기, 약 450개 이하의 잔기, 약 400개 이하의 잔기, 또는 약 350개 이하의 잔기를 포함할 수 있다. 엔도뉴클레아제는 약 700 내지 약 1,100개의 잔기를 포함할 수 있다. 엔도뉴클레아제는 약 400 내지 약 600개의 잔기를 포함할 수 있다. 일부 경우에, 조작된 가이드 리보핵산 구조체는 단일 리보핵산 폴리뉴클레오타이드를 포함한다. 단일 리보핵산 폴리뉴클레오타이드는 가이드 리보핵산 서열 및 tracr 리보핵산 서열을 포함할 수 있다.

[0095] 일부 경우에, 가이드 리보핵산 서열은 원핵생물, 박테리아, 고세균, 진핵생물, 진균, 식물, 포유동물, 또는 인간 게놈 서열에 상보적이다. 일부 경우에, 가이드 리보핵산 서열은 원핵 게놈 서열에 상보적이다. 일부 경우에, 가이드 리보핵산 서열은 박테리아 게놈 서열에 상보적이다. 일부 경우에, 가이드 리보핵산 서열은 고세균 게놈 서열에 상보적이다. 일부 경우에, 가이드 리보핵산 서열은 진핵 게놈 서열에 상보적이다. 일부 경우에, 가이드 리보핵산 서열은 진균 게놈 서열에 상보적이다. 일부 경우에, 가이드 리보핵산 서열은 식물 게놈 서열에 상보적이다. 일부 경우에, 가이드 리보핵산 서열은 포유동물 게놈 서열에 상보적이다. 일부 경우에, 가이드 리보핵산 서열은 인간 게놈 서열에 상보적이다.

[0096] 일부 경우에, 가이드 리보핵산 표적화 서열 또는 스페이서는 10-30 뉴클레오타이드 길이, 또는 12-28 뉴클레오타이드 길이, 또는 15-24 뉴클레오타이드 길이이다. 일부 경우에, 엔도뉴클레아제는 엔도뉴클레아제의 N- 또는 C-말단에 근접한 하나 이상의 핵 위치화 서열(NLS)을 포함한다. 일부 경우에, NLS는 서열번호: 205-220으로부터 선택된 서열을 포함한다.

[0097] *표 1. 본 개시내용에 따른 Cas 효과기와 함께 사용될 수 있는 예시적인 NLS 서열*

공급원	**NLS 아미노산 서열**	서열번호:
SV40 NLS	PKKKRKV	205
뉴클레오플라스민 이분	KRPAATKKAGQAKKKK	206
c-myc	PAAKRVKLD	207
c-myc	RQRRNELKRSP	208
hnRNPA1 M9	NQSSNFGPMKGGNFGGRSSGPYGGGGQYFAKPRNQGGY	209
임포르틴-알파 IBB 도메인	RMRIZFKNKGKDTAELRRRRVEVSVELRKAKKDEQILKRRNV	210
근종 T 단백질	VSRKRPRP	211
근종 T 단백질	PPKKARED	212
p53	PQPKKKPL	213
마우스 c-abl IV	SALIKKKKKMAP	214
인플루엔자 바이러스 NS1	DRLRR	215
인플루엔자 바이러스 NS1	PKQKKRK	216
간염 바이러스 델타 항원	RKLKKKIKKL	217
마우스 Mx1 단백질	REKKKFLKRR	218
인간 폴리(ADP-리보스) 중합효소	KRKGDEVDGVDEVAKKKSKK	219
스테로이드 호르몬 수용체 글루코코르티코이드	RKCLQAGMNLEARKTKK	220

[0098]

[0099] 하나 이상의 보존적 아미노산 치환을 갖는 본원에 기재된 임의의 효소의 변이체가 본 개시내용에 포함된다. 이러한 보존적 치환은 폴리펩타이드의 3차원 구조 또는 기능을 파괴하지 않으면서 폴리펩타이드의 아미노산 서열에서 이루어질 수 있다. 보존적 치환은 유사한 소수성, 극성, 및 R 사슬 길이를 갖는 아미노산을 서로 치환함으로써 달성될 수 있다. 추가적으로, 또는 대안적으로, 상이한 종으로부터의 상동성 단백질의 정렬된 서열을 비교함으로써, 보존적 치환은 암호화된 단백질의 기본 기능을 변경하지 않으면서 종 사이에 돌연변이된 아미노산 잔기(예컨대, 비보존된 잔기)를 위치시킴으로써 확인될 수 있다. 이러한 보존적으로 치환된 변이체는 본원에 기재된 엔도뉴클레아제 단백질 서열 중 어느 하나에 대해 적어도 약 20%, 적어도 약 25%, 적어도 약 30%, 적어도 약 35%, 적어도 약 40%, 적어도 약 45%, 적어도 약 50%, 적어도 약 55%, 적어도 약 60%, 적어도 약 65%, 적어도 약 70%, 적어도 약 75%, 적어도 약 80%, 적어도 약 85%, 적어도 약 86%, 적어도 약 87%, 적어도 약 88%, 적어도 약 89%, 적어도 약 90%, 적어도 약 91%, 적어도 약 92%, 적어도 약 93%, 적어도 약 94%, 적어도 약 95%, 적어도 약 96%, 적어도 약 97%, 적어도 약 98%, 적어도 약 99%의 동일성을 갖는 변이체를 포함할 수 있다. 일부 구현예에서, 이러한 보존적으로 치환된 변이체는 기능적 변이체이다. 이러한 기능적 변이체는 엔도뉴클레아제의 하나 이상의 중요한 활성 부위 잔기 또는 가이드 RNA 결합 잔기의 활성이 파괴되지 않도록 치환을 갖는 서열을 포괄할 수 있다. 일부 구현예에서, 본원에 기재된 임의의 단백질의 기능적 변이체는 도 4에서 언급된 보존된 또는 기능적 잔기 중 적어도 하나의 치환이 결여되어 있다. 일부 구현예에서, 본원에 기재된 임의의 단백질의 기능적 변이체는 도 4에서 언급된 모든 보존된 또는 기능적 잔기의 치환이 결여되어 있다. 또한 본원에 기재된 임의의 뉴클레아제의 변경된 활성 변이체가 본 개시내용에 의해 제공된다. 이러한 변경된 활성 변이체는 본원에서(예컨대, 도 4에서) 확인되거나 RuvC 도메인에 대해 일반적으로 기재된 하나 이상의 촉매 잔기에 불활성화 돌연변이를 포함할 수 있다. 이러한 변경된 활성 변이체는 RuvCI, RuvCII 또는 RuvCIII 도메인의 촉매 잔기에서 변화-전환 돌연변이를 포함할 수 있다.

[0100] 기능적으로 유사한 아미노산을 제공하는 보존적 치환 표는 다양한 참고문헌으로부터 이용가능하다(예컨대, Creighton, Proteins: Structures and Molecular Properties (W H Freeman & Co.; 2nd edition (December

1993) 참고). 하기 8개의 그룹은 각각 서로에 대한 보존적 치환인 아미노산을 함유한다:

[0101] 1) 알라닌(A), 글리신(G);

[0102] 2) 아스파르트산(D), 글루탐산(E);

[0103] 3) 아스파라긴(N), 글루타민(Q);

[0104] 4) 아르기닌(R), 리신(K);

[0105] 5) 이소류신(I), 류신(L), 메티오닌(M), 발린(V);

[0106] 6) 페닐알라닌(F), 티로신(Y), 트립토판(W);

[0107] 7) 세린(S), 트레오닌(T); 및

[0108] 8) 시스테인(C), 메티오닌(M)

[0109] 특정 도메인에 대한 서열 동일성을 갖는 본원에 기재된 임의의 엔도뉴클레아제의 변이체가 본 개시내용에 포함되어 있다. 도메인은 아르기닌 풍부 도메인(예컨대, PF14239 상동성을 갖는 도메인), REC(인식) 도메인, BH(브릿지 나선) 도메인, WED(웨지) 도메인, PI(PAM-상호작용) 도메인, PF14239 상동성 도메인, 또는 본원에 기재된 임의의 다른 도메인일 수 있다. 일부 구현예에서, 이들 도메인 중 하나 이상을 포괄하는 잔기는 하기 단백질 중 하나에 정렬함으로써(예컨대, 하기 단백질 중 하나와 관심있는 단백질이 최적으로 정렬될 때) 단백질에서 확인되고, 여기서 예시적인 도메인에 대한 잔기 경계가 기재되어 있다.

[0110] *표 2: 본원에 기재된 엔도뉴클레아제에 대한 예시적인 도메인 경계*

[0111]

	RuvC-I	**BH**	**REC**	**도메인 w/ PF14239 상동성**	**RuvC-II**	**HNH**	**RuvC-III**	**WED 및 PI**
MG34-1 효과기	1-41	42-76	77-281	4-65; 123-339	282-323	324-459	460-551	552-747
MG34-9 효과기	1-41	42-76	77-280	4-65; 123-338	281-322	323-490	491-582	583-778

[0112] 일부 경우에, 조작된 뉴클레아제 시스템은 단일 가닥 DNA 복구 주형을 추가로 포함한다. 일부 경우에, 조작된 뉴클레아제 시스템은 이중 가닥 DNA 복구 주형을 추가로 포함한다. 일부 경우에, 단일 또는 이중 가닥 DNA 복구 주형은 5'부터 3'까지 표적 데옥시리보핵산 서열의 5'에 적어도 20개의 뉴클레오타이드의 서열을 포함하는 제1 상동성 암을 포함한다. 일부 경우에, 단일 또는 이중 가닥 DNA 복구 주형은 5'부터 3'까지 적어도 10개의 뉴클레오타이드의 합성 DNA 서열을 포함한다. 일부 경우에, 단일 또는 이중 가닥 DNA 복구 주형은 5'부터 3'까지 표적 서열의 3'에 적어도 20개의 뉴클레오타이드의 서열을 포함하는 제2 상동성 암을 포함한다. 일부 경우에, 단일 또는 이중 가닥 DNA 복구 주형은 5'부터 3'까지 표적 데옥시리보핵산 서열의 5'에 적어도 20개의 뉴클레오타이드의 서열을 포함하는 제1 상동성 암, 적어도 10개의 뉴클레오타이드의 합성 DNA 서열, 또는 표적 서열의 3'에 적어도 20개의 뉴클레오타이드의 서열을 포함하는 제2 상동성 암을 포함한다.

[0113] 일부 경우에, 제1 상동성 암은 적어도 10개, 적어도 20개, 적어도 30개, 적어도 40개, 적어도 50개, 적어도 60개, 적어도 70개, 적어도 80개, 적어도 90개, 적어도 100개, 적어도 110개, 적어도 120개, 적어도 130개, 적어도 140개, 적어도 150개, 적어도 175개, 적어도 200개, 적어도 250개, 적어도 300개, 적어도 400개, 적어도 500개, 적어도 750개, 또는 적어도 1000개의 뉴클레오타이드의 서열을 포함한다. 일부 경우에, 조작된 뉴클레아제 시스템은 Mg^{2+}의 공급원을 추가로 포함한다. 일부 경우에, 엔도뉴클레아제 및 tracr 리보핵산 서열은 별개의 박테리아 종으로부터 유래된다. 일부 경우에, 엔도뉴클레아제 및 tracr 리보핵산 서열은 동일한 문 내의 별개의 박테리아 종으로부터 유래된다.

[0114] 일부 경우에, 엔도뉴클레아제는 서열번호: 1-24 또는 462-488 중 어느 하나에 대해 적어도 50%, 적어도 55%, 적어도 50%, 적어도 55%, 적어도 60%, 적어도 65%, 적어도 70%, 적어도 75%, 적어도 80%, 적어도 85%, 적어도 90%, 적어도 91%, 적어도 92%, 적어도 93%, 적어도 94%, 적어도 95%, 적어도 96%, 적어도 97%, 적어도 98%, 또는 적어도 99%의 서열 동일성을 갖는 서열을 포함한다. 일부 경우에, 가이드 RNA 구조체는 헤어핀을 포함할 것

으로 예측된 RNA 서열을 포함한다. 일부 경우에, 헤어핀은 스템 및 루프를 포함한다. 일부 경우에, 스템은 적어도 12쌍, 적어도 14쌍, 적어도 16쌍 또는 적어도 18쌍의 리보뉴클레오타이드를 포함한다.

[0115] 일부 경우에, 가이드 RNA 구조체는 제2 스템 및 제2 루프를 추가로 포함한다. 일부 경우에, 제2 스템은 적어도 5쌍, 적어도 6쌍, 적어도 7쌍, 적어도 8쌍, 적어도 9쌍 또는 적어도 10쌍의 리보뉴클레오타이드를 포함한다. 일부 경우에, 가이드 RNA 구조체는 RNA 구조체를 추가로 포함하고, 이러한 RNA 구조체는 적어도 2개의 헤어핀을 포함한다. 일부 경우에, 엔도뉴클레아제는 서열번호: 1에 대해 적어도 50%, 적어도 55%, 적어도 50%, 적어도 55%, 적어도 60%, 적어도 65%, 적어도 70%, 적어도 75%, 적어도 80%, 적어도 85%, 적어도 90%, 적어도 91%, 적어도 92%, 적어도 93%, 적어도 94%, 적어도 95%, 적어도 96%, 적어도 97%, 적어도 98%, 또는 적어도 99%의 서열 동일성을 갖는 서열을 포함하고, 가이드 RNA 구조체는 적어도 4개의 헤어핀을 포함하도록 예측된 RNA 서열을 포함한다. 일부 경우에, 이들 4개의 헤어핀 각각은 스템 및 루프를 포함한다.

[0116] 일부 경우에, 조작된 뉴클레아제 시스템은 서열번호: 1에 대해 적어도 50%, 적어도 55%, 적어도 50%, 적어도 55%, 적어도 60%, 적어도 65%, 적어도 70%, 적어도 75%, 적어도 80%, 적어도 85%, 적어도 90%, 적어도 91%, 적어도 92%, 적어도 93%, 적어도 94%, 적어도 95%, 적어도 96%, 적어도 97%, 적어도 98%, 또는 적어도 99%의 동일한 서열을 포함한다. 일부 경우에, 조작된 뉴클레아제 시스템은 서열번호: 199 또는 서열번호: 201의 비가변 뉴클레오타이드 중 적어도 하나에 대해 적어도 50%, 적어도 55%, 적어도 50%, 적어도 55%, 적어도 60%, 적어도 65%, 적어도 70%, 적어도 75%, 적어도 80%, 적어도 85%, 적어도 90%, 적어도 91%, 적어도 92%, 적어도 93%, 적어도 94%, 적어도 95%, 적어도 96%, 적어도 97%, 적어도 98%, 또는 적어도 99% 동일한 서열을 포함하는 가이드 RNA 구조체를 포함한다.

[0117] 일부 경우에, 조작된 뉴클레아제 시스템은 서열번호: 1-24 또는 462-488 중 어느 하나에 대해 적어도 50%, 적어도 55%, 적어도 50%, 적어도 55%, 적어도 60%, 적어도 65%, 적어도 70%, 적어도 75%, 적어도 80%, 적어도 85%, 적어도 90%, 적어도 91%, 적어도 92%, 적어도 93%, 적어도 94%, 적어도 95%, 적어도 96%, 적어도 97%, 적어도 98%, 또는 적어도 99% 동일한 서열을 포함한다. 일부 경우에, 조작된 뉴클레아제 시스템은 서열번호: 199-200 또는 669-673 중 어느 하나 또는 서열번호:201-203 또는 613-616 중 어느 하나의 비가변 뉴클레오타이드에 대해 적어도 50%, 적어도 55%, 적어도 50%, 적어도 55%, 적어도 60%, 적어도 65%, 적어도 70%, 적어도 75%, 적어도 80%, 적어도 85%, 적어도 90%, 적어도 91%, 적어도 92%, 적어도 93%, 적어도 94%, 적어도 95%, 적어도 96%, 적어도 97%, 적어도 98%, 또는 적어도 99% 동일한 서열을 포함한다.

[0118] 일부 경우에, 서열 동일성은 BLASTP, CLUSTALW, MUSCLE, MAFFT, 또는 스미스-워터맨 상동성 검색 알고리즘 파라미터를 갖는 CLUSTALW에 의해 결정된다. 일부 경우에, 서열 동일성은 3의 단어길이(W), 10의 기대값(E), 및 11의 존재, 1의 확장에서 갭 비용을 설정하는 BLOSUM62의 파라미터를 사용하고 조건부 구성 스코어 매트릭스 조정을 사용하는 상기 BLASTP 상동성 검색 알고리즘에 의해 결정된다.

[0119] 일부 경우에, 엔도뉴클레아제는 Cas9 엔도뉴클레아제, Cas14 엔도뉴클레아제, Cas12a 엔도뉴클레아제, Cas12b 엔도뉴클레아제, Cas12c 엔도뉴클레아제, Cas12d 엔도뉴클레아제, Cas12e 엔도뉴클레아제, Cas13a 엔도뉴클레아제, Cas13b 엔도뉴클레아제, Cas13c 엔도뉴클레아제, 또는 Cas13d 엔도뉴클레아제가 아니다. 일부 경우에, 엔도뉴클레아제는 Cas9 엔도뉴클레아제에 대해 80% 미만의 동일성, 75% 미만의 동일성, 70% 미만의 동일성, 65% 미만의 동일성, 60% 미만의 동일성, 55% 미만의 동일성, 또는 50% 미만의 동일성을 갖는다.

[0120] 일 양태에서, 본 개시내용은 (a) DNA 표적화 분절을 포함하는 조작된 가이드 RNA를 제공한다. 일부 경우에, DNA 표적화 분절은 표적 DNA 분자 내의 표적 서열에 상보적인 뉴클레오타이드 서열을 포함한다. 일부 경우에, 조작된 단일 가이드 리보핵산 폴리뉴클레오타이드는 단백질 결합 분절을 포함한다. 단백질 결합 분절은 이중 가닥 RNA(dsRNA) 듀플렉스를 형성하기 위해 혼성화하는 뉴클레오타이드의 2개의 상보적인 스트레치를 포함한다. 일부 경우에, 뉴클레오타이드의 2개의 상보적인 스트레치는 개재하는 뉴클레오타이드와 함께 서로 공유적으로 연결된다. 일부 경우에, 조작된 가이드 리보핵산 폴리뉴클레오타이드는 서열번호: 1-198, 221-459, 463-612, 또는 617-668 중 어느 하나에 대해 적어도 50%, 적어도 55%, 적어도 50%, 적어도 55%, 적어도 55%, 적어도 60%, 적어도 65%, 적어도 70%, 적어도 75%, 적어도 80%, 적어도 85%, 적어도 90%, 적어도 91%, 적어도 92%, 적어도 93%, 적어도 94%, 적어도 95%, 적어도 96%, 적어도 97%, 적어도 98%, 또는 적어도 99%의 서열 동일성을 갖는 변이체를 포함하는 엔도뉴클레아제와 복합체를 형성하도록 구성된다.

[0121] 일부 경우에, DNA 표적화 분절은 뉴클레오타이드의 2개의 상보적인 스트레치 모두의 5'에 위치한다. 일부 경우에, 단백질 결합 분절은 서열번호: 199-200 또는 669-673 중 어느 하나 또는 서열번호: 201-203 또는 613-616 중 어느 하나의 비가변 뉴클레오타이드에 대해 적어도 50%, 적어도 55%, 적어도 50%, 적어도 55%, 적어도 60%,

적어도 65%, 적어도 70%, 적어도 75%, 적어도 80%, 적어도 85%, 적어도 90%, 적어도 91%, 적어도 92%, 적어도 93%, 적어도 94%, 적어도 95%, 적어도 96%, 적어도 97%, 적어도 98%, 또는 적어도 99% 동일한 서열을 포함한다. 일부 경우에, 데옥시리보핵산 폴리뉴클레오타이드는 본원에 기재된 조작된 가이드 리보핵산 폴리뉴클레오타이드를 코딩한다.

[0122] 일 양태에서, 본 개시내용은 조작된 핵산 서열을 포함하는 핵산을 제공한다. 일부 경우에, 조작된 핵산 서열은 유기체에서의 발현을 위해 최적화된다. 일부 경우에, 핵산은 엔도뉴클레아제를 코딩한다. 엔도뉴클레아제는 Cas 엔도뉴클레아제일 수 있다. 엔도뉴클레아제는 클래스 2 엔도뉴클레아제일 수 있다. 엔도뉴클레아제는 클래스 2, 유형 II Cas 엔도뉴클레아제일 수 있다. 일부 경우에, 엔도뉴클레아제는 RuvC 도메인 및 HNH 도메인을 포함한다. 일부 경우에, 엔도뉴클레아제는 배양되지 않은 미생물로부터 유래된다. 일부 경우에, 엔도뉴클레아제는 특정 분자량 범위를 갖는다. 일부 구현예에서 엔도뉴클레아제는 약 120 kDa 이하, 약 110 kDa 이하, 약 105 kDa 이하, 약 100 kDa 이하, 약 95 kDa 이하, 약 90 kDa 이하, 약 95 kDa 이하, 약 80 kDa 이하, 약 75 kDa 이하, 약 70 kDa 이하, 약 65 kDa 이하, 약 60 kDa 이하, 약 55 kDa 이하, 약 50 kDa 이하, 약 45 kDa 이하, 약 40 kDa 이하, 약 35 kDa 이하, 약 30 kDa 이하, 약 25 kDa 이하, 약 20 kDa 이하, 약 15 kDa 이하, 또는 약 10 kDa 이하의 분자량을 갖는다. 일부 경우에, 조작된 가이드 리보핵산 구조체는 적어도 2개의 리보핵산 폴리뉴클레오타이드를 포함한다. 일부 경우에, 엔도뉴클레아제는 특정 수의 잔기를 포함한다. 엔도뉴클레아제는 약 1,100개 이하의 잔기, 약 1,000개 이하의 잔기, 약 950개 이하의 잔기, 약 900개 이하의 잔기, 약 850개 이하의 잔기, 약 800개 이하의 잔기, 약 750개 이하의 잔기, 약 700개 이하의 잔기, 약 650개 이하의 잔기, 약 600개 이하의 잔기, 약 550개 이하의 잔기, 약 500개 이하의 잔기, 약 450개 이하의 잔기, 약 400개 이하의 잔기, 또는 약 350개 이하의 잔기를 포함할 수 있다. 엔도뉴클레아제는 약 700 내지 약 1,100개의 잔기를 포함할 수 있다. 엔도뉴클레아제는 약 400 내지 약 600개의 잔기를 포함할 수 있다. 일부 경우에, 엔도뉴클레아제는 서열번호: 1-198, 221-459, 463-612, 또는 617-668 또는 이에 대해 적어도 50%, 적어도 55%, 적어도 50%, 적어도 50%, 적어도 55%, 적어도 60%, 적어도 65%, 적어도 70%, 적어도 75%, 적어도 80%, 적어도 85%, 적어도 90%, 적어도 91%, 적어도 92%, 적어도 93%, 적어도 94%, 적어도 95%, 적어도 96%, 적어도 97%, 적어도 98%, 또는 적어도 99%의 서열 동일성을 갖는 이의 변이체를 포함한다. 일부 경우에, 엔도뉴클레아제는 상기 엔도뉴클레아제의 N- 또는 C-말단에 근접한 하나 이상의 핵 위치화 서열(NLS)을 코딩하는 서열을 추가로 포함한다. 일부 경우에, NLS는 서열번호: 205-220으로부터 선택된 서열을 포함한다.

[0123] 일부 경우에, 유기체는 원핵생물, 박테리아, 진핵생물, 진균, 식물, 포유동물, 설치류, 또는 인간이다. 일부 경우에, 유기체는 원핵생물이다. 일부 경우에, 유기체는 박테리아이다. 일부 경우에, 유기체는 진핵생물이다. 일부 경우에, 유기체는 진균이다. 일부 경우에, 유기체는 식물이다. 일부 경우에, 유기체는 포유동물이다. 일부 경우에, 유기체는 설치류이다. 일부 경우에, 유기체는 인간이다. 유기체가 원핵생물 또는 박테리아인 경우, 유기체는 엔도뉴클레아제가 유래된 유기체와 상이한 유기체일 수 있다. 일부 경우에, 유기체는 배양되지 않은 미생물이 아니다.

[0124] 일 양태에서, 본 개시내용은 핵산 서열을 포함하는 벡터를 제공한다. 일부 경우에, 핵산 서열은 엔도뉴클레아제를 코딩한다. 일부 경우에, 엔도뉴클레아제는 Cas 엔도뉴클레아제이다. 일부 경우에, 엔도뉴클레아제는 클래스 2 엔도뉴클레아제이다. 일부 경우에, 엔도뉴클레아제는 클래스 2, 유형 II Cas 엔도뉴클레아제이다. 엔도뉴클레아제는 RuvC-I 도메인 및 HNH 도메인을 포함할 수 있다. 일부 경우에, 엔도뉴클레아제는 배양되지 않은 미생물로부터 유래된다. 일부 경우에, 엔도뉴클레아제는 특정 분자량 범위를 갖는다. 일부 구현예에서 엔도뉴클레아제는 약 120 kDa 이하, 약 110 kDa 이하, 약 105 kDa 이하, 약 100 kDa 이하, 약 95 kDa 이하, 약 90 kDa 이하, 약 95 kDa 이하, 약 80 kDa 이하, 약 75 kDa 이하, 약 70 kDa 이하, 약 65 kDa 이하, 약 60 kDa 이하, 약 55 kDa 이하, 약 50 kDa 이하, 약 45 kDa 이하, 약 40 kDa 이하, 약 35 kDa 이하, 약 30 kDa 이하, 약 25 kDa 이하, 약 20 kDa 이하, 약 15 kDa 이하, 또는 약 10 kDa 이하의 분자량을 갖는다. 일부 경우에, 조작된 가이드 리보핵산 구조체는 적어도 2개의 리보핵산 폴리뉴클레오타이드를 포함한다. 일부 경우에, 엔도뉴클레아제는 특정 수의 잔기를 포함한다. 엔도뉴클레아제는 약 1,100개 이하의 잔기, 약 1,000개 이하의 잔기, 약 950개 이하의 잔기, 약 900개 이하의 잔기, 약 850개 이하의 잔기, 약 800개 이하의 잔기, 약 750개 이하의 잔기, 약 700개 이하의 잔기, 약 650개 이하의 잔기, 약 600개 이하의 잔기, 약 550개 이하의 잔기, 약 500개 이하의 잔기, 약 450개 이하의 잔기, 약 400개 이하의 잔기, 또는 약 350개 이하의 잔기를 포함할 수 있다. 엔도뉴클레아제는 약 700 내지 약 1,100개의 잔기를 포함할 수 있다. 엔도뉴클레아제는 약 400 내지 약 600개의 잔기를 포함할 수 있다.

[0125] 일부 양태에서, 본 개시내용은 프로토스페이서 인접 모티프(PAM)의 5'에 상기 표적 유전자좌의 근위에서 이중

가닥 파단을 유도하도록 구성된 본원에 기재된 엔도뉴클레아제를 제공한다. 엔도뉴클레아제는 PAM으로부터 6-8개 뉴클레오타이드 또는 PAM으로부터 7개 뉴클레오타이드에서 이중 가닥 파단을 유도할 수 있다. 일부 양태에서, 본 개시내용은 프로토스페이서 인접 모티프(PAM)의 5'에 상기 표적 유전자좌의 근위에서 단일 가닥 파단을 유도하도록 구성된 본원에 기재된 엔도뉴클레아제를 제공한다. 엔도뉴클레아제는 PAM으로부터 6-8개 뉴클레오타이드 또는 PAM으로부터 7개 뉴클레오타이드에서 단일 가닥 파단을 유도할 수 있다. 일부 경우에, 단일 가닥 파단을 유도하도록 구성된 엔도뉴클레아제는 본원에 기재된 엔도뉴클레아제의 하나 이상의 촉매 잔기에서 불활성화 돌연변이를 포함한다.

[0126] 일부 양태에서, 본 개시내용은 엔도뉴클레아제 시스템에 의해 표적화된 표적 유전자좌 내 또는 근위에서 뉴클레오타이드 염기의 화학적 변형을 유발하도록 구성된 본원에 기재된 엔도뉴클레아제 시스템을 제공한다. 이 경우, 뉴클레오타이드 염기의 화학적 변형은 일반적으로 뉴클레오타이드의 당 또는 포스페이트 부분의 변형보다는 염기쌍 형성에 관여하는 화학적 모이어티의 변형을 지칭한다. 화학적 변형은 아데노신 또는 시토신 뉴클레오타이드의 탈아민화를 포함할 수 있다. 일부 경우에, 화학적 변형을 유발하도록 구성된 엔도뉴클레아제 시스템은 상기 엔도뉴클레아제에 인프레임으로 결합 또는 융합된 염기 에디터를 갖는 엔도뉴클레아제를 포함한다. 염기 에디터가 융합되거나 결합되는 엔도뉴클레아제는 엔도뉴클레아제(예컨대, RuvC 도메인 내)의 적어도 하나의 촉매 잔기에서 불활성화 돌연변이를 포함할 수 있다. 염기 에디터는 상기 엔도뉴클레아제에 대해 N- 또는 C-말단으로 융합되거나, 화학적 접합을 통해 연결될 수 있다. 염기 에디터는 비제한적으로 아데노신 데아미나제 RNA 특이적 1(ADAR1), 아데노신 데아미나제 RNA 특이적 2(ADAR2), 아포리포단백질 B MRNA 에디팅 효소 촉매 서브유닛 1(APOBEC1), 아포리포단백질 B MRNA 에디팅 효소 촉매 서브유닛 2(APOBEC2), 아포리포단백질 B MRNA 에디팅 효소 촉매 서브유닛 3A(APOBEC3A), 아포리포단백질 B MRNA 에디팅 효소 촉매 서브유닛 3B(APOBEC3B), 아포리포단백질 B MRNA 에디팅 효소 촉매 서브유닛 3C(APOBEC3C), 아포리포단백질 B MRNA 에디팅 효소 촉매 서브유닛 3D(APOBEC3D), 아포리포단백질 B MRNA 에디팅 효소 촉매 서브유닛 3F(APOBEC3F), 아포리포단백질 B MRNA 에디팅 효소 촉매 서브유닛 3G(APOBEC3G), 아포리포단백질 B MRNA 에디팅 효소 촉매 서브유닛 3H(APOBEC3H), 또는 아포리포단백질 B MRNA 에디팅 효소 촉매 서브유닛 4(APOBEC4), 또는 이의 기능적 단편을 포함하는 임의의 아데노신 또는 시토신 데아미나제를 포함할 수 있다. 염기 에디터는 효모, 진핵생물, 포유동물, 또는 인간 염기 에디터를 포함할 수 있다.

[0127] 일부 양태에서, 본 개시내용은 엔도뉴클레아제 시스템에 의해 표적화된 표적 유전자좌 내 또는 근위에서 히스톤의 화학적 변형을 유발하도록 구성된 본원에 기재된 엔도뉴클레아제 시스템을 제공한다. 일부 경우에, 히스톤의 화학적 변형을 유발하도록 구성된 엔도뉴클레아제 시스템은 상기 엔도뉴클레아제에 인프레임으로 결합 또는 융합된 히스톤 에디터를 갖는 엔도뉴클레아제를 포함한다. 히스톤 에디터는 엔도뉴클레아제에 대해 N- 또는 C-말단으로 결합 또는 융합될 수 있다. 일부 구현예에서, 화학적 변형은 메틸화, 아세틸화, 탈메틸화, 또는 탈아세틸화를 포함할 수 있다. 히스톤 에디터가 융합되거나 결합되는 엔도뉴클레아제는 엔도뉴클레아제(예컨대, RuvC 도메인 내)의 적어도 하나의 촉매 잔기에서 불활성화 돌연변이를 포함할 수 있다. 히스톤 에디터는 히스톤 메틸트랜스퍼라제(예컨대, ASH1L, DOT1L, EHMT1, EHMT2, EZH1, EZH2, MLL, MLL2, MLL3, MLL4, MLL5, NSD1, PRDM2, SET, SETBP1, SETD1A, SETD1B, SETD2, SETD3, SETD4, SETD5, SETD6, SETD7, SETD8, SETD9, SETDB1, SETDB2, SETMAR, SMYD1, SMYD2, SMYD3, SMYD4, SMYD5, SUV39H1, SUV39H2, SUV420H1, 또는 SUV420H2), 히스톤 데메틸라제(예컨대, KDM1, KDM2, KDM3, KDM4, KDM5, 또는 KDM6 패밀리), 히스톤 아세틸트랜스퍼라제(예컨대, GNAT 또는 HAT 패밀리 아세틸트랜스퍼라제), 또는 히스톤 탈아세틸라제(예컨대, HDAC1, HDAC2, HDAC 3, HDAC4, HDAC5, HDAC6, HDAC7, HDAC8, HDAC9, HDAC10, HDAC11, SIRT1, SIRT2, SIRT3, SIRT4, SIRT5, SIRT6, 또는 SIRT7)를 포함할 수 있다. 히스톤 에디터는 효모, 진핵생물, 포유동물, 또는 인간 히스톤 에디터를 포함할 수 있다.

[0128] 일 양태에서, 본 개시내용은 본원에 기재된 핵산을 포함하는 벡터를 제공한다. 일부 경우에, 벡터는 조작된 가이드 리보핵산 구조체를 코딩하는 핵산을 추가로 포함한다. 조작된 가이드 리보핵산 구조체는 엔도뉴클레아제와 복합체를 형성하도록 구성될 수 있다. 일부 경우에, 조작된 가이드 리보핵산 구조체는 가이드 리보핵산 서열을 포함한다. 일부 경우에, 가이드 리보핵산 서열은 표적 데옥시리보핵산 서열에 혼성화하도록 구성된다. 일부 경우에, 조작된 가이드 리보핵산 구조체는 tracr 리보핵산 서열을 포함한다. 일부 경우에, tracr 리보핵산 서열은 엔도뉴클레아제에 결합하도록 구성된다. 일부 경우에, 벡터는 플라스미드, 미니서클, CELiD, 아데노 연관 바이러스(AAV) 유래 비리온, 또는 렌티바이러스이다.

[0129] 일 양태에서, 본 개시내용은 본원에 기재된 임의의 벡터를 포함하는 세포를 제공한다.

[0130] 일 양태에서, 본 개시내용은 엔도뉴클레아제를 제조하는 방법을 제공한다. 방법은 본원에 기재된 임의의 세포를

배양하는 단계를 포함할 수 있다.

[0131] 일 양태에서, 본 개시내용은 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드를 결합, 절단, 마킹 또는 변형시키는 방법을 제공한다. 방법은 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드를 엔도뉴클레아제와 접촉시키는 단계를 포함할 수 있다. 일부 경우에, 엔도뉴클레아제는 Cas 엔도뉴클레아제이다. 일부 경우에, 엔도뉴클레아제는 클래스 2 엔도뉴클레아제이다. 일부 경우에, 엔도뉴클레아제는 클래스 2, 유형 II Cas 엔도뉴클레아제이다. 엔도뉴클레아제는 조작된 가이드 리보핵산 구조체와 복합될 수 있다. 일부 경우에, 조작된 가이드 리보핵산 구조체는 엔도뉴클레아제 및 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드에 결합하도록 구성된다. 일부 경우에, 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드는 프로토스페이서 인접 모티프(PAM)를 포함한다. 일부 경우에, 엔도뉴클레아제는 약 120 kDa 이하, 약 110 kDa 이하, 약 100 kDa 이하, 약 90 kDa 이하, 약 80 kDa 이하, 약 70 kDa 이하, 약 60 kDa 이하, 약 50 kDa 이하, 약 40 kDa 이하, 약 30 kDa 이하, 약 20 kDa 이하, 또는 약 10 kDa 이하의 분자량을 갖는다. 일부 경우에, 엔도뉴클레아제는 서열번호: 1-198, 221-459, 463-612, 또는 617-668 중 어느 하나에 대해 적어도 50%, 적어도 55%, 적어도 50%, 적어도 55%, 적어도 60%, 적어도 65%, 적어도 70%, 적어도 75%, 적어도 80%, 적어도 85%, 적어도 90%, 적어도 91%, 적어도 92%, 적어도 93%, 적어도 94%, 적어도 95%, 적어도 96%, 적어도 97%, 적어도 98%, 또는 적어도 99%의 서열 동일성을 갖는 변이체를 포함한다.

[0132] 일 양태에서, 본 개시내용은 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드를 결합, 절단, 마킹 또는 변형시키는 방법을 제공한다. 방법은 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드를 엔도뉴클레아제와 접촉시키는 단계를 포함할 수 있다. 일부 경우에, 엔도뉴클레아제는 Cas 엔도뉴클레아제이다. 일부 경우에, 엔도뉴클레아제는 클래스 2 엔도뉴클레아제이다. 일부 경우에, 엔도뉴클레아제는 클래스 2, 유형 II Cas 엔도뉴클레아제이다. 엔도뉴클레아제는 조작된 가이드 리보핵산 구조체와 복합될 수 있다. 일부 경우에, 조작된 가이드 리보핵산 구조체는 엔도뉴클레아제 및 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드에 결합하도록 구성될 수 있다. 일부 경우에, 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드는 프로토스페이서 인접 모티프(PAM)를 포함한다. 일부 경우에, PAM은 NGG이다. 일부 경우에, 엔도뉴클레아제는 서열번호: 1-198, 221-459, 463-612, 또는 617-668 중 어느 하나에 대해 적어도 50%, 적어도 55%, 적어도 50%, 적어도 55%, 적어도 60%, 적어도 65%, 적어도 70%, 적어도 75%, 적어도 80%, 적어도 85%, 적어도 90%, 적어도 91%, 적어도 92%, 적어도 93%, 적어도 94%, 적어도 95%, 적어도 96%, 적어도 97%, 적어도 98%, 또는 적어도 99%의 서열 동일성을 갖는 변이체를 포함한다.

[0133] 일부 경우에, 엔도뉴클레아제는 Cas9 엔도뉴클레아제, Cas14 엔도뉴클레아제, Cas12a 엔도뉴클레아제, Cas12b 엔도뉴클레아제, Cas12c 엔도뉴클레아제, Cas12d 엔도뉴클레아제, Cas12e 엔도뉴클레아제, Cas13a 엔도뉴클레아제, Cas13b 엔도뉴클레아제, Cas13c 엔도뉴클레아제, 또는 Cas13d 엔도뉴클레아제가 아니다. 일부 경우에, 엔도뉴클레아제는 배양되지 않은 미생물로부터 유래된다. 일부 경우에, 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드는 원핵생물, 고세균, 박테리아, 진핵생물, 식물, 진균, 포유동물, 설치류, 또는 인간 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드이다. 일부 경우에, 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드는 엔도뉴클레아제가 유래된 종 이외의 종으로부터의 원핵생물, 고세균, 또는 박테리아 이중 가닥 데옥시리보핵산 폴리뉴클레오타이드이다.

[0134] 일 양태에서, 본 개시내용은 표적 핵산 유전자좌를 변형시키는 방법을 제공한다. 방법은 본원에 기재된 조작된 뉴클레아제 시스템을 표적 핵산 유전자좌에 전달하는 단계를 포함할 수 있다. 일부 경우에, 엔도뉴클레아제는 조작된 가이드 리보핵산 구조체와 복합체를 형성하도록 구성된다. 일부 경우에, 복합체는 복합체가 표적 핵산 유전자좌에 결합시, 복합체가 표적 핵산 유전자좌를 변형시키도록 구성된다. 일부 경우에, 표적 핵산 유전자좌의 변형은 표적 핵산 유전자좌를 결합, 니킹, 절단, 또는 마킹하는 것을 포함한다.

[0135] 일부 경우에, 표적 핵산 유전자좌는 데옥시리보핵산(DNA) 또는 리보핵산(RNA)을 포함한다. 일부 경우에, 표적 핵산은 게놈 진핵 DNA, 바이러스 DNA, 또는 박테리아 DNA를 포함한다. 일부 경우에, 표적 핵산은 박테리아 DNA를 포함한다. 박테리아 DNA는 엔도뉴클레아제가 유래된 종과 상이한 박테리아 종으로부터 유래될 수 있다. 일부 경우에, 표적 핵산 유전자좌는 시험관 내에 있다. 일부 경우에, 핵산 유전자좌는 세포 내에 있다. 일부 경우에, 엔도뉴클레아제 및 조작된 가이드 핵산 구조체는 별개의 핵산 분자 상에 코딩되어 제공된다. 일부 경우에, 세포는 원핵 세포, 박테리아 세포, 진핵 세포, 진균 세포, 식물 세포, 동물 세포, 포유동물 세포, 설치류 세포, 영장류 세포, 또는 인간 세포이다. 일부 경우에, 세포는 엔도뉴클레아제가 유래되는 종과 상이한 종으로부터 유래된다.

[0136] 일부 경우에, 조작된 뉴클레아제 시스템을 표적 핵산 유전자좌에 전달하는 것은 본원에 기재된 핵산 또는 본원에 기재된 벡터를 전달하는 것을 포함한다. 일부 경우에, 조작된 뉴클레아제 시스템을 표적 핵산 유전자좌에 전

달하는 것은 엔도뉴클레아제를 코딩하는 오픈 리딩 프레임을 포함하는 핵산을 전달하는 것을 포함한다. 일부 경우에, 핵산은 엔도뉴클레아제를 코딩하는 오픈 리딩 프레임이 작동가능하게 연결된 프로모터를 포함한다. 일부 경우에, 조작된 뉴클레아제 시스템을 표적 핵산 유전자좌에 전달하는 것은 상기 엔도뉴클레아제를 코딩하는 오픈 리딩 프레임을 함유하는 캡핑된 mRNA를 전달하는 것을 포함한다. 일부 경우에, 조작된 뉴클레아제 시스템을 상기 표적 핵산 유전자좌에 전달하는 것은 번역된 폴리펩타이드를 전달하는 것을 포함한다.

[0137] 일부 경우에, 조작된 뉴클레아제 시스템을 표적 핵산 유전자좌에 전달하는 것은 리보핵산(RNA) pol III 프로모터에 작동가능하게 연결된 조작된 가이드 리보핵산 구조체를 코딩하는 데옥시리보핵산(DNA)을 전달하는 것을 포함한다. 일부 경우에, 엔도뉴클레아제는 표적 유전자좌에서 또는 근위에서 단일 가닥 파단 또는 이중 가닥 파단을 유도한다.

[0138] 본 개시내용의 시스템은 예를 들어, 핵산 에디팅(예컨대, 유전자 에디팅), 핵산 분자에 대한 결합(예컨대, 서열 특이적 결합)과 같은 다양한 응용 분야에 사용될 수 있다. 이러한 시스템은 예를 들어, 대상체에서 질환을 유발할 수 있는 유전적으로 유전된 돌연변이를 다루는 데(예컨대, 제거 또는 대체하는 데), 세포에서 그의 기능을 확인하기 위해 유전자를 불활성화시키는 데, 질환을 유발하는 유전 요소를 검출하기 위한 진단 도구로서(예컨대, 역전사된 바이러스 RNA 또는 질환 유발 돌연변이를 코딩하는 증폭된 DNA 서열의 절단을 통해), 특정 뉴클레오타이드 서열(예컨대, 항생제 내성 int 박테리아를 코딩하는 서열)을 표적화 및 검출하는 프로브와 조합된 불활성화된 효소로서, 바이러스 게놈을 표적화함으로써 바이러스를 불활성이게 만들거나 숙주 세포를 감염시킬 수 없게 만들기 위해, 유전자를 추가하거나 대사 경로를 수정하여 유기체가 귀중한 소분자, 거대분자 또는 이차 대사산물을 생산하기 위해, 진화 선택을 위한 유전자 구동 요소를 확립하기 위해, 바이오센서로서 외래의 소분자와 뉴클레오타이드에 의한 세포 교란을 검출하기 위해 사용될 수 있다.

[0139] **실시예**

[0140] **실시예 1. - 메타게놈학에 의한 새로운 Cas 효과기의 발견**

[0141] *메타게놈 마이닝*

[0142] 메타게놈 샘플을 퇴적물, 토양 및 동물로부터 수집하였다. 데옥시리보핵산(DNA)을 Zymobiomics DNA 미니프렙 키트로 추출하고, Illumina HiSeq® 2500 상에서 시퀀싱하였다. 샘플은 재산 소유자의 동의하에 수집하였다. DNA를 Qiagen DNeasy PowerSoil 키트 또는 ZymoBIOMICS DNA 미니프렙 키트를 사용하여 샘플로부터 추출하였다. DNA를 시퀀싱 라이브러리 준비(Illumina TruSeq) 및 Illumina HiSeq 4000 또는 Novaseq 상의 시퀀싱을 위해 UC 버클리의 Vincent J. Coates Genomics Sequencing 실험실로 보냈다(400-800 bp 표적 삽입 크기를 갖는 쌍을 형성한 150 염기쌍(bp) 리드). 또한, 공개적으로 이용가능한 고온뿐만 아니라 토양 및 해양 메타게놈 시퀀싱 데이터를 NCBI SRA로부터 다운로드받았다. 시퀀싱 리드를 BBMap(Bushnell B., sourceforge.net/projects/bbmap/)을 사용하여 트리밍(trimming)하고 Megahit(https://paperpile.com/c/QSZG6K/clMrh)를 사용하여 조립하였다. 단백질 서열을 Prodigal(https://paperpile.com/c/QSZG6K/BJ6oW)을 사용하여 예측하였다. 공지된 II형 CRISPR 뉴클레아제의 HMM 프로파일을 구축하고, HMMER3(hmmer.org)을 사용하여 모든 예측된 단백질에 대해 검색하였다. CRISPR 어레이를 Minced(https://github.com/ctSkennerton/minced 또는 https://paperpile.com/c/QSZG6K/OPC44)를 사용하여 조립된 컨티그(contig) 상에서 예측하였다. 분류학을 Kaiju https://paperpile.com/c/QSZG6K/nMi6k를 사용하여 단백질에 할당하고, 모든 코딩된 단백질의 공통(consensus)을 발견함으로써 컨티그 분류학을 결정하였다.

[0143] 예측된 및 참조(예컨대, SpCas9, SaCas9, 및 AsCas9) 유형 II 효과기 단백질을 MAFFT(https://paperpile.com/c/QSZG6K/sVHNH)를 사용하여 정렬하고, FastTree2(https://paperpile.com/c/QSZG6K/osZNM)를 사용하여 계통발생 트리를 추론하였다. 이 연구에서 회수된 서열로 구성된 클레이드(clade)로부터 새로운 패밀리를 확인하였다. 패밀리 내에서, 후보가 실험실 분석을 위한 모든 필요한 구성요소를 함유한 경우(즉, 이들이 CRISPR 어레이를 이용하여 잘 조립되고 주석이 달린 컨티그에서 발견되었음), 상기 후보를 선택하였다. 선택된 대표 및 참조 서열을 MUSCLE(https://paperpile.com/c/QSZG6K/ITOla)을 사용하여 정렬하여 촉매성 및 PAM 상호작용 잔기를 확인하였다.

[0144] 이러한 메타게놈 워크플로우는 본원에 기재된 SMART(SMall ARchaeal-associaTed) 엔도뉴클레아제 시스템의 설계를 초래하였다.

[0145] *활성 잔기 서명을 함유하는 SMART 엔도뉴클레아제의 발견*

[0146] 메타게놈 데이터로부터 조립된 수만 개의 고품질 CRISPR Cas 시스템의 마이닝은 RuvC와 HNH 도메인을 모두를 함유하는 새로운 효과기를 알아내었지만, 이들은 매우 작은 크기(<900 aa)였다. 이들 효과기 뉴클레아제는 기준점으로서 고세균 Cas9 엔도뉴클레아제에 대해 단지 낮은 서열 유사성(<20% 아미노산 동일성)을 나타내었다. 효과기 단백질 서열의 계통발생 분석은 SMART 시스템이 서브유형 A, B 또는 C로부터 잘 연구된 유형 II 시스템에 비해 발산된 그룹임을 나타내었다(도 **1A**).

[0147] 이러한 작은 "SMART" 효과기(~400 - 1000개의 아미노산, **도 2**)는 CRISPR 어레이에 인접한 게놈 내의 유전자좌에서 나타났다. 이러한 인접한 SMART 유전자좌 중 일부는 또한 tracrRNA 및 동일한 오페론 내의 CRISPR 각색 유전자(예컨대, 스페이서 획득에 관여하는 유전자) cas1, cas2 및/또는 cas4를 코딩할 것으로 예측된 서열을 포함하였다(**도 3**). 작은 크기에도 불구하고, SMART 효과기는 참조 SaCas9 서열과 정렬될 때 6개의 추정적인 HNH 및 RuvC 촉매 잔기를 함유한다(**도 4**). 또한, 3D 구조 예측은 가이드 및 표적 결합뿐만 아니라 PAM의 인식에 관여하는 잔기를 확인하였고, 이는 SMART 효과기가 활성 dsDNA 엔도뉴클레아제임을 시사한다.

[0148] *SMART 엔도뉴클레아제의 다수의 그룹*

[0149] 중요한 촉매성 및 결합 잔기의 위치에 기초하여, SMART 뉴클레아제는 3개의 RuvC 도메인, 일반적으로 RRxRR 모티프를 함유하는 아르기닌 풍부 영역(예컨대, PF14239 상동성을 갖는 도메인), HNH 엔도뉴클레아제 도메인, 및 추정적 인식 도메인을 포함한다(**도 5** 및 **도 6**). 이들 도메인은 참조 서열과 낮은 서열 유사성을 공유한다(**도 7**). 또한, SMART 효과기뿐만 아니라 참조 고세균 서열은 Cas9 뉴클레아제보다 유의하게 더 빈번하게 RRxRR 및 아연 결합 리본 모티프(CX[2-4]C 또는 CX[2-4]H)를 함유한다(**도 8**). 또한, Cas9 효과기 서열과는 달리, 대부분의 SMART 효과기는 Pfam 도메인 PF14239에 대해 유의한 히트(hit)를 포함하며, 이는 종종 다양한 엔도뉴클레아제와 연관된다. SMART 효과기 크기, 계통발생 관계, 및 오페론과 도메인 아키텍처 둘 모두의 차이에 기초하여, 본 발명자들은 이들 시스템을 2개의 기본 그룹 SMART I 및 SMART II로 분류하였다. 이들 그룹의 두드러진 특징이 하기 표 3에 요약되어 있으며, 이는 또한 클래스 2, 유형 II A/B/C Cas 효소와 비교한 차이를 예시한다.

[0150] *표 3: 본원에 기재된 SMART I 및 II 그룹 효소의 속성*

속성	SMART I	SMART II	유형 II: A, B, C
Zn-결합 잔기	네	네	아니오
브릿지 나선	네	아니오	네
PAM 상호작용 및 WED 도메인	네	아니오	네
RRxRR 모티프	네	네	아니오
REC 도메인	PF14239 와 상동성을 갖는 신규 도메인	C-말단에 신규 도메인	Cas9 REC 도메인
도메인 w/ PF14239 상동성	네	네	아니오
단일계통발생 클레이드	네	아니오	네
TnpB 와 관련됨	네	네	네
오페론은 IS605 Tns 반복을 함유함	아니오	때때로	아니오
<900 아미노산	때때로	네	아니오
CRISPR 관련	네	때때로	네
RuvC 및 HNH 를 함유함	네	네	네

[0151]

[0152] *SMART I 엔도뉴클레아제*

[0153] SMART I 효과기는 약 700개 아미노산 내지 1,050개 아미노산 크기 범위이다. 그들의 게놈 문맥에서의 공통적인 특징은 각색 모듈 유전자(예컨대, 스페이서 획득에 관여하는 유전자) 및 CRISPR 어레이 근처의 예측된 tracrRNA였으며, 이의 조직화는 유형 II 및 유형 V CRISPR 시스템과 유사하였다(**도 3A, 3B** 및 **3C**). SMART I 효과기 내의 RRXRR 모티프 함유 영역은 독특하지만 Cas9 뉴클레아제에서 아르기닌 풍부 브릿지 나선과 유사한 기능적 역할을 할 수 있다. SaCas9 결정 구조에 대해 모델링했을 때, SMART I 효과기의 예측된 3D 구조체는 인식 로브(종종 Pfam 도메인 PF14239를 포함함) 및 RuvC-II 도메인 내의 정렬되지 않은 영역을 보여 주었다(**도 5**). 결과는 이들 도메인이 다른 유형 II 효과기에 비해 상이한 기원을 갖는다는 것을 나타내었다. 유형 II 효과기 계통발생 트리에서의 이들의 발산 배치와 공지된 유형 II 효과기에 대한 이들의 낮은 서열 유사성을 종합하면(**도 1A**), 이들 결과는 SMART I 엔도뉴클레아제가 유형 II CRISPR 시스템의 새로운 그룹에 속한다는 것을 나타낸다. 허용된 CRISPR 시스템의 분류에 따라, 이들 SMART I 시스템은 유형 II-D로 분류되었다.

[0154] 추정적 단일 가이드 RNA(sgRNA)를 SMART I MG34-1 시스템에 대한 환경적 RNA 발현 데이터를 사용하여 조작하였다. 또한, SMART I 반복 및 tracrRNA 예측으로부터 설계된 다수의 sgRNA를 PAM 농축 분석에서 시험관내에서 시험하였다. SMART I 효소의 경우, PAM 서열의 최적 확인을 이 단계에서 말단 복구 및 평활 말단 라이게이션을 사용하여 수행하였고, 이는 이들 효소가 엇갈린 이중 가닥 DNA 파단을 생성할 수 있음을 시사한다. 분석은 다수의 sgRNA 설계를 사용하여 MG34-1(서열번호: 2), MG34-9(서열번호: 9) 및 MG34-16(서열번호: 17)에 대한 dsDNA 절단을 확인시켜 주었다(서열번호: 612-615의 사용을 도시하는 도 7). MG34-1은 표적 인식 및 절단을 위한 NGGN PAM에 대한 선호도를 입증하였다(**도 8a**). 절단 부위의 분석은 위치 7에서의 우선적인 절단을 나타내었다(**도 8b**). 이러한 결과는 PAM으로부터의 위치 2-3에서 우선적으로 절단하는 다른 유형 II 효소로부터의 절단 메커니즘과 비교하여 새로운 생화학적 메커니즘을 시사하며, 이는 SMART I CRISPR 시스템에 대한 새로운 분류를 지원한다.

[0155] 일부 SMART I 시스템에 대한 환경적 발현 데이터는 CRISPR 어레이의 원위치 전사 및 예측된 tracrRNA를 코딩하는 유전자간 영역을 확인시켜 주었다(**도 3B** 및 **3C**). 추가적으로, 활성 CRISPR 표적화 사례를 동일하거나 관련된 메타게놈으로부터 조립된 다른 게놈 서열과 매치하는 스페이서 서열을 검색함으로써 평가하였다. 이들 선을 따라, SMART I CRISPR 어레이에서 코딩된 스페이서 중 하나에 의해 표적화되는 파지 게놈(**도 3C** 및 **3D**)이 확인되었다. 표적 서열에 인접한 영역의 분석은 GG 모티프를 함유하는 3' PAM 서열을 제시한다(**도 3D**). 이러한 결과는 SMART I CRISPR 시스템이 파지 방어에 관여하는 RNA 가이드된 효과기로서 그의 자연 환경에서 활성화되어, 표적화된 DNA 또는 RNA를 절단하거나 분해하는 뉴클레아제로서 기능할 가능성이 있음을 나타낸다.

[0156] *SMART I 효과기는 활성, RNA 가이드된 dsDNA CRISPR 엔도뉴클레아제이다*

[0157] 추정적 단일 가이드 RNA(sgRNA)를 SMART I MG34-1 및 MG34-16 시스템에 대한 환경적 RNA 발현 데이터를 사용하여 조작하였다(**도 3B** 및 **도 3C** 및 **도 9**). 또한, SMART I 반복 및 tracrRNA 예측으로부터 설계된 다수의 sgRNA를 PAM 농축 분석에서 시험관내에서 시험하였다(도 10). 분석은 다수의 sgRNA 설계로 MG34-1, MG34-9 및 MG34-16에 대한 프로그래밍 가능한 dsDNA 절단을 확인시켜 주었다(**도 10**). MG34-1 및 MG34-9는 표적 인식 및 절단을 위해 NGGN PAM을 필요로 한다(**도 11A** 및 **11C**). 절단 부위의 분석은 위치 7에서의 우선적인 절단을 나타낸다(**도 11B** 및 **11C**). 이러한 결과는 PAM으로부터의 위치 3에서 우선적으로 절단하는 Cas9 효소와 비교하여 새로운 생화학적 절단 메커니즘을 시사하며, SMART I CRISPR 시스템에 대한 새로운 분류에 대한 추가적인 지원을 제공한다.

[0158] 말단 복구 단계가 없는 PAM 농축 분석은 SMART I 뉴클레아제에 대한 활성을 나타내지 않았다. PAM 농축 프로토콜에서 라이게이션 전에 평활 말단 단편을 생성하기 위한 말단 복구에 대한 필요는 이들 효소가 엇갈린 이중 가닥 DNA 파단을 생성한다는 것을 나타낸다.

[0159] *E. coli*에서 수행된 실험은 시스템이 세포에서 뉴클레아제로서 기능하는 데 필요한 활성을 갖는다는 것을 보여주었다. MG34-1 및 sgRNA를 발현하는 *E. coli* 균주를 sgRNA에 대한 표적을 함유하는 카나마이신 내성 플라스미드로 형질전환시켰다. 항생제의 존재 하에서, 항생제 내성 플라스미드의 성공적인 표적화 및 절단은 성장 결함을 초래할 것이다. 분석은 sgRNA에 대한 표적을 함유하지 않은 카나마이신 내성 플라스미드로 수행된 대조군 실험과 비교하여 약 2배 성장 억제를 나타내었다(**도 12**).

[0160] *SMART II 엔도뉴클레아제*

[0161] SMART II 효과기는 SMART I 효과기에 비해 더 작은 것(~400개 아미노산 - 600개 아미노산)을 왜곡하는 크기 분포를 갖는다. 그들의 게놈 문맥은 비정상적인 반복 영역 또는 CRISPR 어레이를 시사하였다. 비-CRISPR 반복 영

역은 약 10 내지 30 bp 초과 크기 범위의 직접적인 반복을 함유한다. 일부 경우에, 이들은 다수의 별개의 반복 단위를 포함한다. 때때로, 일반적인 CRISPR 확인 알고리즘은 이러한 영역을 CRISPR 시스템으로서 표시할 것이지만, 면밀한 조사는 스페이서 서열로서 확인된 영역이 어레이에서 반복된다는 것을 밝혀낼 것이다. 어레이는 효과기에 바로 인접하지는 않지만 이들은 동일한 게놈 영역에 있다(**도 3A**, MG35-236 및 **도 13A**, 예컨대, 효과기 유전자로부터 >20 kb). SMART II 시스템 오페론은 일반적으로 각색 모듈 유전자(예컨대, 스페이서 획득에 관여하는 유전자)가 없다.

[0162] 구조적 예측은 클래스 2, 유형 II Cas 효과기에서 종종 발견되는 모든 6개의 RuvC 및 HNH 뉴클레아제 촉매 잔기 이외에도(**도 6**) 가이드 RNA 결합, 표적 절단, PAM의 인식 및 PAM과의 상호작용에 관여하는 Cas 효소의 특징적인 잔기를 확인하였다. 또한, SMART II 효과기는 아마도 표적 핵산 모티프의 인식 및 결합에 관여하는 다수의 RRXRR 및 아연 결합 리본 모티프($CX_{[2-4]}C$ 또는 $CX_{[2-4]}H$)를 함유하였다. 중요한 잔기의 위치에 기초하여, SMART II 뉴클레아제의 예측된 도메인 아키텍처는 3개의 RuvC 서브도메인, RRxRR 모티프를 함유하는 아르기닌 풍부 영역(예컨대, PF14239 상동성을 갖는 도메인), HNH 엔도뉴클레아제 도메인, 미지의 도메인, 및 인식 도메인(REC)으로 구성되었다(**도 6**). SMART II 효과기의 도메인 아키텍처는 유형 II Cas9 뉴클레아제에 대한 공지된 도메인 아키텍처와 상이하였다(**도 6** 및 **도 14**).

[0163] 일부 SMART II 시스템에 대한 환경적 전사체 데이터는 자연 환경에서 CRISPR 어레이 및 다른 반복 영역의 원위치 발현을 확인하였다(**도 13A**). 일부 SMART II 효과기의 5' 비번역 영역(UTR)의 전사가 또한 환경적 발현 데이터로부터 관찰되었고(**도 13B**), 이는 이 영역이 뉴클레아제 활성 또는 SMART 시스템의 조절에 중요할 수 있음을 시사한다.

[0164] SMART II 효과기 단백질, 반복 영역, 및 연관된 유전자간 영역을 이용하여 수행된 예비적인 시험관내 실험은 이들 효소가 아마도 프로그램가능한 방식으로 dsDNA를 절단하는 능력을 가질 수 있음을 보여준다(**도 15**). 결과는 SMART II 뉴클레아제 활성이 CRISPR 어레이와 같은 반복 영역을 사용하는 것을 필요로 할 수 있는 RNA 및/또는 DNA 가이드될 수 있거나, 또는 TIR 또는 5' UTR과 같은 유전자좌 내에 코딩된 특징의 인식을 통해서임을 시사한다.

[0165] 일부 SMART II 효과기는 TnpA 및 TnpB 트랜스포사제를 코딩하는 추정적 삽입 서열(IS) 옆에서 관찰되었다(**도 3A**). IS의 말단은 예측된 헤어핀 구조를 갖는 말단 역전 반복(TIR)을 함유하는 것으로서 확인되었고, IS가 가장 통합될 가능성이 높은 표적 부위 복제가 또한 확인되었다. 또한, 일부 SMART II 유전자좌는 SMART II 효과기에 측접하는 추정적 TIR을 코딩하였다(예컨대, **도 3**).

[0166] **실시예 2.- 본원에 기재된 엔도뉴클레아제에 대한 PAM 서열 식별/확인**

[0167] 추정적 SMART 엔도뉴클레아제를 *E. coli* 용해물 기반 발현 시스템(PURExpress, New England Biolabs)에서 발현시켰다. 이 시스템에서, 엔도뉴클레아제를 *E. coli*에 대해 코돈 최적화하고, T7 프로모터 및 C-말단 His 태그를 갖는 벡터 내로 클로닝하였다. 유전자를 각각 T7 프로모터 및 터미네이터 서열의 상류 및 하류 150 bp에 있는 프라이머 결합 부위로 PCR 증폭시켰다. 이 PCR 산물을 5 nM 최종 농도로 NEB PURExpress에 첨가하고, 37℃에서 2시간 동안 발현시켜 PAM 분석을 위한 엔도뉴클레아제를 생산하였다.

[0168] 본원에 기재된 각각의 SMART Cas 효소와 양립가능한 추정적 sgRNA를 시퀀싱 데이터로부터 조립된 컨티그 CRISPR 유전자좌에 조립된 RNAseq 리드로부터 확인하였다: 이차 구조를 Geneious 소프트웨어 패키지(https://www.geneious.com)에서 CRISPR 어레이로부터의 반복 서열과 함께 RNAseq 데이터로부터 tracr 영역에 대해 결정하였고, 생성된 나선을 트리밍하고 GAAA 테트라루프와 연결하였다. 반복-항-반복-반복 나선 트리밍의 다수의 길이뿐만 아니라 상이한 스페이서 길이 및 상이한 tracr 종결점을 시험하였다(서열번호: 612-615를 입증하는 도 12). 그 다음, 각각의 sgRNA를 조립 PCR을 통해 조립하고, SPRI 비드로 정제하고, 짧은 RNA 전사체에 대한 제조업체의 권장 프로토콜에 따라 시험관내 전사(IVT)하였다(HiScribe T7 kit, NEB). RNA 전사 반응을 Monarch RNA 키트로 세정하고 Tapestation(Agilent)을 통해 순도를 확인하였다.

[0169] 추정적 뉴클레아제에 의해 절단될 수 있는 무작위로 생성된 잠재적 PAM 서열을 함유하는 플라스미드를 시퀀싱함으로써 PAM 서열을 결정하였다. 이 시스템에서, 추정적인 뉴클레아제를 코딩하는 *E. coli* 코돈 최적화된 뉴클레오타이드 서열을 T7 프로모터의 제어 하에 PCR 단편으로부터 시험관 내에서 전사하고 번역하였다. T7 프로모터 다음에 반복-스페이서-반복 서열로 구성된 최소 CRISPR 어레이를 갖는 제2 PCR 단편을 동일한 반응에서 전사시켰다. TXTL 시스템에서 엔도뉴클레아제 및 반복-스페이서-반복 서열의 성공적인 발현 후 CRISPR 어레이 처리는 활성인 시험관내 CRISPR 뉴클레아제 복합체를 제공한다.

[0170] 최소 어레이에서 8N 혼합 축퇴성 염기가 선행하는 스페이서 서열 매칭을 함유하는 표적 플라스미드의 라이브러리(잠재적 PAM 서열)를 TXTL 반응의 산물과 함께 인큐베이션하였다(번역된 Cas 효소의 5배 희석물, 5 nM의 8N PAM 플라스미드 라이브러리, 및 PAM 라이브러리를 표적화하는 50 nM의 sgRNA와 함께 10 mM Tris pH 7.5, 100 mM NaCl, 및 10 mM $MgCl_2$). 1-3시간 후, 반응을 중지시키고, DNA를 DNA 정화 키트를 통해 회수하였다. 어댑터 서열은 엔도뉴클레아제에 의해 절단된 활성 PAM 서열을 갖는 DNA에 평활 말단 라이게이션된 반면, 절단되지 않은 DNA는 라이게이션을 위해 접근될 수 없었다. 이어서, 활성 PAM 서열을 포함하는 DNA 분절을 라이브러리에 특이적인 프라이머 및 어댑터 서열을 이용한 PCR에 의해 증폭시켰다. PCR 증폭 산물을 겔 상에서 분해하여 절단 사건에 상응하는 앰플리콘을 확인하였다. 절단 반응의 증폭된 분절을 또한 NGS 라이브러리의 제조를 위한 주형으로서 또는 생어 시퀀싱을 위한 기질로서 사용하였다. 시작하는 8N 라이브러리의 서브세트인 이러한 생성된 라이브러리의 시퀀싱은 CRISPR 복합체와 양립가능한 PAM 활성을 갖는 서열을 밝혀내었다. 처리된 RNA 작제물을 사용한 PAM 시험을 위해, 시험관내 전사된 RNA가 플라스미드 라이브러리와 함께 추가되고 최소 CRISPR 어레이/tracr 주형이 생략된 점을 제외하고는 동일한 절차를 반복하였다. 다음의 스페이서 서열을 이들 분석에서 표적으로서 사용하였다(5'-CGUGAGCCACCACGUCGCAAGCCUCGAC-3').

[0171] PAM 분석으로부터 원시 시퀀싱 리드를 수득한 후, 리드를 Phred 품질 스코어 > 20에 의해 필터링하였다. PAM에 인접한 백본으로부터의 공지된 DNA 서열을 나타내는 24 bp를 사용하여 PAM 근접 영역을 찾고, 인접한 8 bp를 추정적인 PAM으로서 확인하였다. 또한 각 리드에 대해 PAM과 라이게이션된 어댑터 사이의 거리를 측정하였다. 참조 서열 또는 어댑터 서열과 정확히 일치하지 않는 리드는 제외하였다. 가장 빈번한 절단 부위 ±2 bp를 갖는 PAM만이 분석에 포함되도록 PAM 서열을 절단 부위 빈도에 의해 필터링하였다. 필터링된 PAM 목록을 사용하여 Logomaker를 생성하였다(본원에 참조로 포함된 Tareen A, Kinney JB. Logomaker: beautiful sequence logos in Python. Bioinformatics. 2020;36(7):2272-2274).

[0172] **실시예 3. - 예측된 RNA 폴딩을 위한 프로토콜**

[0173] 활성 단일 RNA 서열의 예측된 RNA 폴딩을 Andronescu 2007의 방법을 사용하여 37° 에서 계산한다. 염기의 색상은 상기 염기의 염기쌍 형성 확률에 해당하며, 여기서 빨간색은 높은 확률이고 파란색은 낮은 확률이다.

[0174] **실시예 4. - 시험관내 절단 효율**

[0175] 엔도뉴클레아제는 프로테아제 결핍 *E. coli* B 균주에서 유도성 T7 프로모터로부터 His 태그된 융합 단백질로서 발현된다. 엔도뉴클레아제를 2개의 핵 위치화 신호(N-말단 NLS 뉴클레오플라스민 이분 및 C-말단 시미안 바이러스 40 T-항원 NLS PPKKKRK), 말토스 결합 단백질(MBP) 태그, 담배 에치 바이러스(TEV) 프로테아제 절단 부위, 및 6XHis 태그에 N부터 C 말단까지 하기 순서로 융합시켰다: 6XHis-MBP-TEV-NLS-gene-NLS-STOP. 이 단백질을 자가유도 배지(MagicMedia ThermoFisher)에 의해 NEB Iq *E. coli*에서 pTac 프로모터 하에서 발현시키고, 30℃에서 성장시키고, 16℃에서 유도하였다.

[0176] His 태그된 단백질을 발현하는 세포를 초음파 처리에 의해 용해시키고, His 태그된 단백질을 AKTA Avant FPLC(GE Lifescience) 상의 HisTrap FF 컬럼(GE Lifescience) 상에서 Ni-NTA 친화성 크로마토그래피에 의해 정제하였다. 용출액을 아크릴아미드 겔(Bio-Rad) 상에서 SDS-PAGE에 의해 분해하고, InstantBlue Ultrafast Coomassie(Sigma-Aldrich)로 염색하였다. 순도를 ImageLab 소프트웨어(Bio-Rad)로 단백질 밴드의 밀도측정법을 사용하여 결정하였다. 정제된 엔도뉴클레아제를 50 mM Tris-HCl, 300 mM NaCl, 1 mM TCEP, 5% 글리세롤로 구성된 저장 완충액 pH 7.5에서 투석하고, -80℃에서 보관하였다.

[0177] 스페이서 서열 및 PAM 서열을 함유하는 표적 DNA(예컨대 실시예 2에서와 같이 결정됨)를 DNA 합성에 의해 제작하였다. 단일 대표 PAM은 PAM이 축퇴성 염기를 가질 때 시험을 위해 선택한다. 표적 DNA는 한쪽 말단으로부터 700 bp에 위치하는 PAM 및 스페이서를 사용한 PCR 증폭을 통해 플라스미드로부터 유래된 2200 bp의 선형 DNA로 구성된다. 성공적인 절단은 700 및 1500 bp의 단편을 초래한다. 표적 DNA, 시험관내 전사된 단일 RNA, 및 정제된 재조합 단백질을 과량의 단백질 및 RNA를 갖는 절단 완충액(10 mM 트리스, 100 mM NaCl, 10 mM $MgCl_2$)에서 조합하고 5분 내지 3시간, 보통 1시간 동안 인큐베이션한다. 반응을 RNAse A의 첨가 및 60분 인큐베이션을 통해 중단시킨다. 그 다음, 반응을 1.2% TAE 아가로스 겔에서 분해하고, 절단된 표적 DNA의 분획을 ImageLab 소프트웨어에서 정량화한다.

[0178] **실시예 5. - *E. coli*에서의 활성**

[0179] *E. coli*는 이중 가닥 DNA 파단을 효율적으로 복구할 능력이 부족하다. 따라서, 게놈 DNA의 절단은 치명적인 사

건일 수 있다. 이러한 현상을 이용하여, 엔도뉴클레아제 활성을 그의 게놈 DNA 내로 통합된 스페이서/표적 및 PAM 서열을 갖는 표적 균주에서 엔도뉴클레아제와 가이드 RNA를 재조합 발현시킴으로써 *E. coli*에서 시험한다.

[0180] 박테리아 세포에서 뉴클레아제 활성을 시험하기 위해, BL21(DE3) 균주(NEB)를 T7 구동 효과기 및 sgRNA(10 ng 각 플라스미드)를 함유하는 플라스미드로 형질전환시키고, 플레이팅하고, 밤새 성장시켰다. 생성된 콜로니를 삼중으로 밤새 배양한 다음, SOB에서 계대배양하고 OD 0.4-0.6까지 성장시켰다. 세포 배양물의 0.5 OD 등가물을 표준 키트 프로토콜(Zymo Mix and Go kit)에 따라 화학적격(chemocompetent)으로 만들고, 백본에 스페이서 및 PAM을 갖거나 갖지 않는 130 ng의 카나마이신 플라스미드로 형질전환시켰다. 열 충격 후, 형질전환을 37℃에서 1시간 동안 SOC에서 회수하고, 뉴클레아제 효율을 유도 배지(항생제 및 0.05 mM IPTG를 갖는 LB 한천 플레이트) 상에서 성장한 5배 희석 시리즈에 의해 결정하였다. 콜로니를 희석 시리즈로부터 정량화하여 뉴클레아제 구동 플라스미드 절단으로 인한 전반적인 억제를 측정하였다.

[0181] 이러한 분석에 대한 결과가 **도 12**에 나타나 있다. **도 12**에서, 패널 (A)는 플라스미드 절단을 입증하는 *E. coli* 균주의 복제 플레이팅을 나타내고; MG34-1 및 sgRNA를 발현하는 *E. coli*를 sgRNA에 대한 표적을 함유하는 카나마이신 내성 플라스미드로 형질전환시켰다(+sp). 성장 장애(+sp) 대 음성 대조군(표적 및 PAM이 없음(-sp))을 보여주는 플레이트 사분면은 효소에 의한 성공적인 표적화 및 절단을 나타낸다. 실험을 2회 반복하였고 삼중으로 수행하였다. **도 12**에서, 패널 B는 표적 조건(+sp) 대 비표적 대조군(-sp)에서의 성장 억제를 나타내는 A의 복제 플레이팅 실험으로부터의 콜로니 형성 단위(cfu) 측정의 그래프를 보여주며, 이는 플라스미드가 절단되었음을 입증한다.

[0182] 그들의 게놈 DNA 내로 통합된 PAM 서열(예컨대 실시예 2에서와 같이 결정됨)을 갖는 조작된 균주를 엔도뉴클레아제를 코딩하는 DNA로 형질전환시킨다. 그 다음, 형질전환체를 화학적격으로 만들고 표적 서열에 특이적이거나("온 표적") 표적에 비특이적("비표적")인 50 ng의 가이드 RNA(예컨대, crRNA)로 형질전환시킨다. 열 충격 후, 형질전환을 37℃에서 2시간 동안 SOC에서 회수한다. 그 다음, 뉴클레아제 효율을 유도 배지 상에서 성장한 5배 희석 시리즈에 의해 결정한다. 콜로니를 희석 시리즈로부터 삼중으로 정량화한다.

[0183] **실시예 6. - 포유류 세포에서 MG CRISPR 복합체의 게놈 절단 활성 시험**

[0184] 포유동물 세포에서의 표적화 및 절단 활성을 나타내기 위해, MG Cas 효과기 단백질 서열을 2개의 포유동물 발현 벡터, 즉 (a) C-말단 SV40 NLS 및 2A-GFP 태그를 갖는 발현 벡터, 및 (b) GFP 태그가 없고 N-말단에 하나 및 C-말단에 하나인 2개의 SV40 NLS 서열을 갖는 발현 벡터에서 시험한다. NLS 서열은 본원에 기재된 임의의 NLS 서열을 포함한다. 일부 경우, 엔도뉴클레아제를 코딩하는 뉴클레오타이드 서열은 포유동물 세포에서의 발현을 위해 코돈 최적화된다.

[0185] 부착된 표적화 서열을 갖는 상응하는 crRNA 서열을 제2 포유동물 발현 벡터 내로 클로닝한다. 2개의 플라스미드를 HEK293T 세포 내로 공동형질감염시킨다. 발현 플라스미드 및 gRNA 표적화 플라스미드를 HEK293T 세포 내로 공동형질감염 72시간 후, DNA를 추출하고 NGS 라이브러리의 제조에 사용한다. 표적 부위의 시퀀싱에서 삽입-결실(indel)을 통해 퍼센트 NHEJ를 측정하여 포유동물 세포에서의 효소의 표적화 효율을 입증한다. 각 단백질의 활성을 시험하기 위해 적어도 10개의 상이한 표적 부위를 선택한다.

[0186] **실시예 7. - 본원에 기재된 MG 패밀리의 예측된 활성**

[0187] 원위치 발현 및 단백질 서열 분석은 이들 효소가 활성 뉴클레아제임을 나타낸다. 이들은 예측된 엔도뉴클레아제 연관 도메인(매치하는 RRXRR 및 HNH_엔도뉴클레아제 Pfam 도메인; 도 2, 3A 및 3B)를 함유하고, 예측된 HNH 및 RuvC 촉매성 잔기(예컨대, 도 2, 3A 및 3B, 직사각형)를 함유한다. 더욱이, 리보뉴클레아제 H-유사 단백질 패밀리에서 발견되는 RRXRR 모티프의 존재는 잠재적인 RNA 표적화 및/또는 뉴클레아제 활성을 나타낸다(도 2 참조).

[0188] 발현 데이터는 후보 MG34-1 뉴클레아제, tracrRNA 및 CRISPR 어레이에 대한 원위치 천연 활성을 확인시켜 준다(도 4).

[0189] **실시예 8. - mRNA 전달을 갖는 포유류 세포에서의 활성**

[0190] mRNA를 이용한 세포 형질감염/형질전환을 이용한 게놈 에디팅을 위해, 코딩 서열을 Twist Bioscience 또는 Thermo Fisher Scientific(GeneArt)의 알고리즘을 사용하여 마우스 또는 인간 코돈 최적화한다. 코딩 엔도뉴클레아제 서열에 부가된 2개의 핵 위치화 신호, 즉 N 및 C 말단에 각각 SV40 및 뉴클레오플라스민을 이용하여 카세트를 제작한다. 추가적으로, 인간 보체 3(C3)으로부터의 비번역 영역을 카세트 내의 코딩 서열의 5' 및 3' 둘 모두에 부가한다.

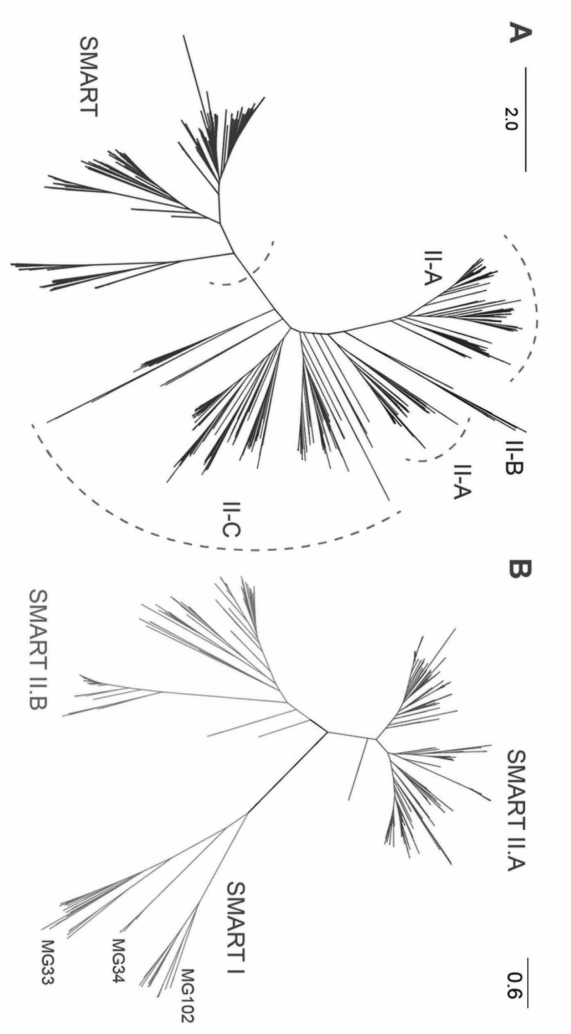
[0191] 그 다음, 이 카세트를 긴 폴리 A 스트레치의 상류에서 mRNA 생산 벡터 내로 클로닝한다. mRNA 작제물 조직화는 다음과 같을 수 있다: C3으로부터의 5' UTR - SV40 NLS - 코돈 최적화 SMART 유전자 - 뉴클레오플라스민 NLS - C3으로부터의 3' UTR - 107 polyA 테일. 그 다음, mRNA의 전사의 실행을 조작된 T7 RNA 중합효소(Hi-T7: New England Biolabs)를 사용하여 T7 프로모터에 의해 구동한다. mRNA의 5' 캡핑은 CleanCap AG(Trilink Biolabs)를 사용하여 공동전사적으로 발생한다. 그 다음, mRNA를 MEGAclear 전사 정화 키트(Thermo Fisher Scientific)를 사용하여 정제한다.

[0192] 포유동물 세포를 Lipofectamine Messenger Max(Thermo Fisher Scientific)를 사용하여 전사된 mRNA 및 관심 게놈 영역을 표적화하는 적어도 10개의 가이드의 세트로 공동형질감염시킨다. 세포를 일정 기간(예컨대, 48시간) 동안 인큐베이션한 다음, Purelink Genomic DNA 추출 키트(Fisher Scientific)를 사용하여 게놈 DNA 분리를 수행한다. 관심 영역을 특정 프라이머를 사용하여 증폭시킨다. 그 다음, 에디팅을 편집 결과의 철저한 분석을 위해 CRISPR 에디트의 추론 및 NGS를 사용한 Sanger 시퀀싱에 의해 평가한다.

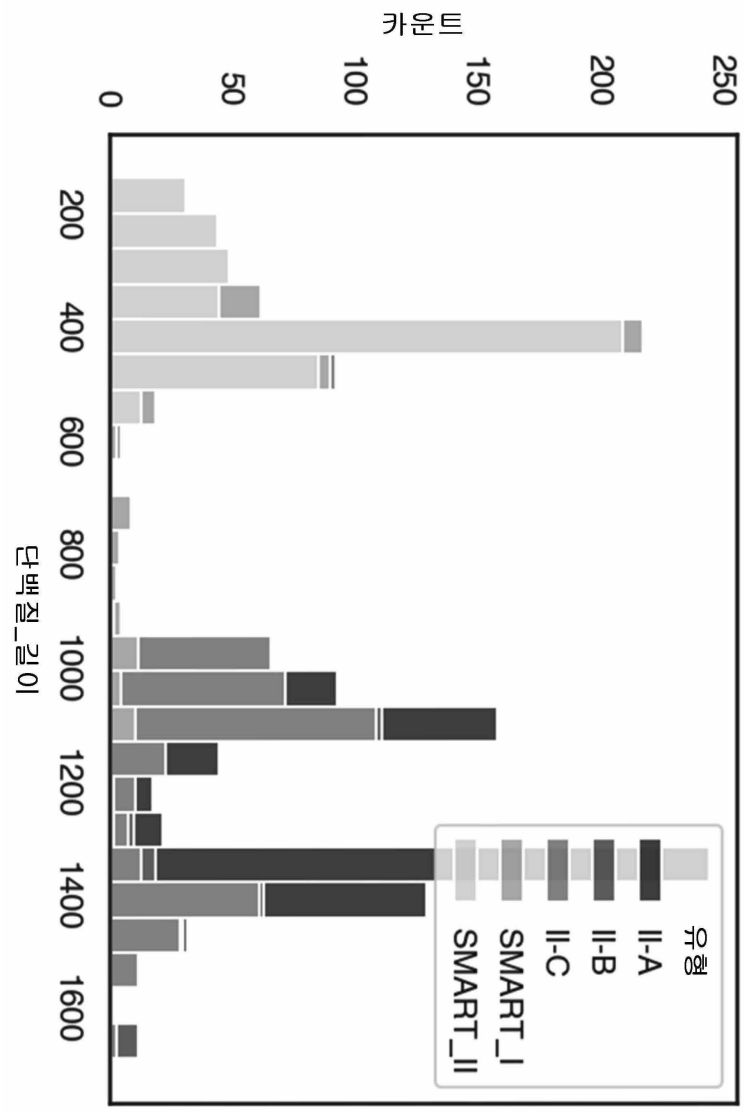
[0193] 본 개시내용의 바람직한 구현예가 본원에 도시되고 설명되었지만, 그러한 구현예는 단지 예로서 제공된다는 것이 당업자에게 명백할 것이다. 본 발명은 명세서 내에 제공된 특정 실시예에 의해 제한되는 것으로 의도되지 않는다. 본 발명은 전술한 명세서를 참조하여 설명되었지만, 본원의 구현예의 설명 및 예시는 제한적인 의미로 해석되는 것을 의미하지 않는다. 수많은 변형, 변화 및 치환이 본 개시내용을 벗어나지 않고 당업자에게 일어날 수 있다. 또한, 본 발명의 모든 양태는 다양한 조건 및 변수에 의존하는 본원에 제시된 특정 묘사, 구성 또는 상대적 비율에 제한되지 않는 것으로 이해되어야 한다. 본원에 기술된 본 발명의 구현예에 대한 다양한 대안이 본 발명을 실행하는데 사용될 수 있는 것으로 이해되어야 한다. 따라서, 본 발명은 임의의 그러한 대안, 변형, 변화 또는 등가물도 포함하는 것으로 고려된다. 하기 청구범위는 본 발명의 범위를 정의하고, 이러한 청구범위 내의 방법 및 구조 및 이의 균등물이 이에 의해 포함되는 것으로 의도된다.

도면

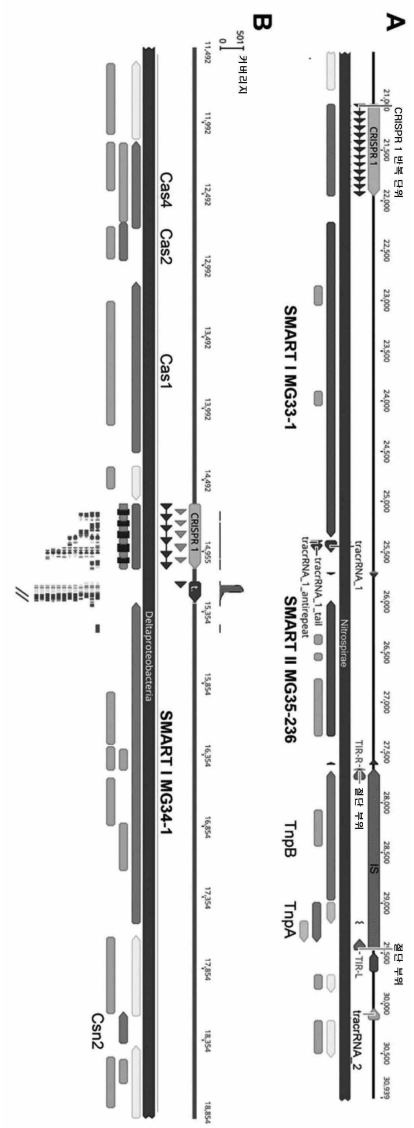
도면1


A
2.0
SMART
II-A
II-B
II-A
II-C
B
SMART II.A
0.6
SMART II.B
SMART I
MG33
MG34
MG102

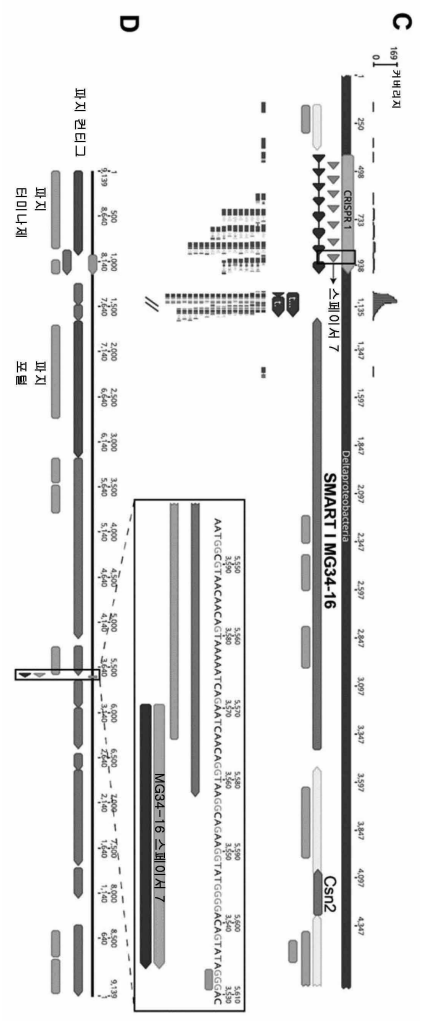
도면2


카운트
0
50
100
150
200
250
단백질_길이
200
400
600
800
1000
1200
1400
1600
유형
II-A
II-B
II-C
SMART_I
SMART_II

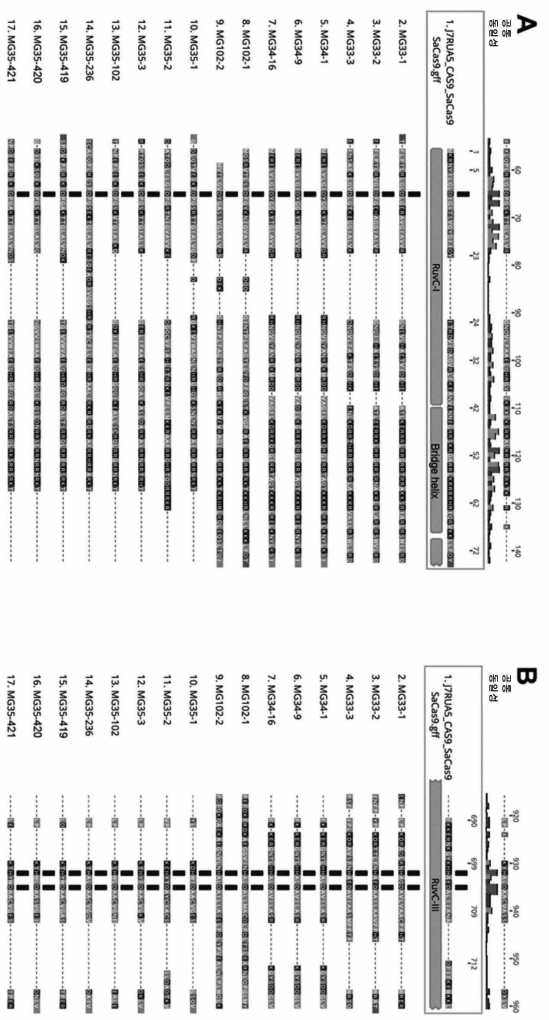
도면3a


A
CRISPR 1 반복 단위
CRISPR 1
tracrRNA_1
Nitrospirae
TIR-R
정단 부위
IS
TIR-L
tracrRNA_2
SMART I MG33-1
tracrRNA_1_tail
tracrRNA_1_antirepeat
SMART II MG35-236
TnpB
TnpA
B
50 kb 카버리지
CRISPR 1
Cas4
Cas2
Cas1
Deltaproteobacteria
SMART I MG34-1
Csn2

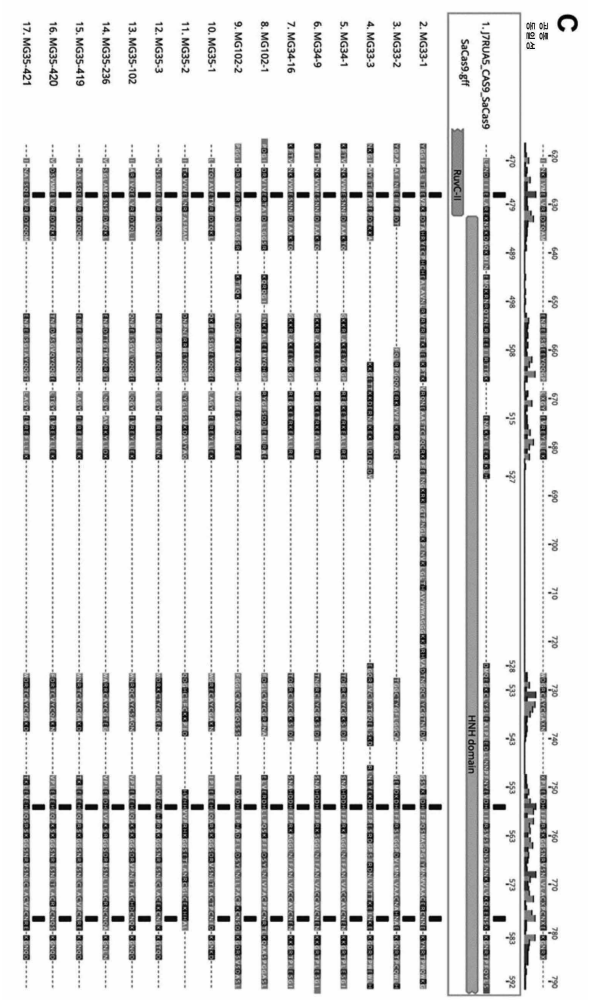
도면3b


C
D
SMART1 MG34-16
스페이서 7
Csn2
CRISPR1
Deltaproteobacteria
MG34-16 스페이서 7

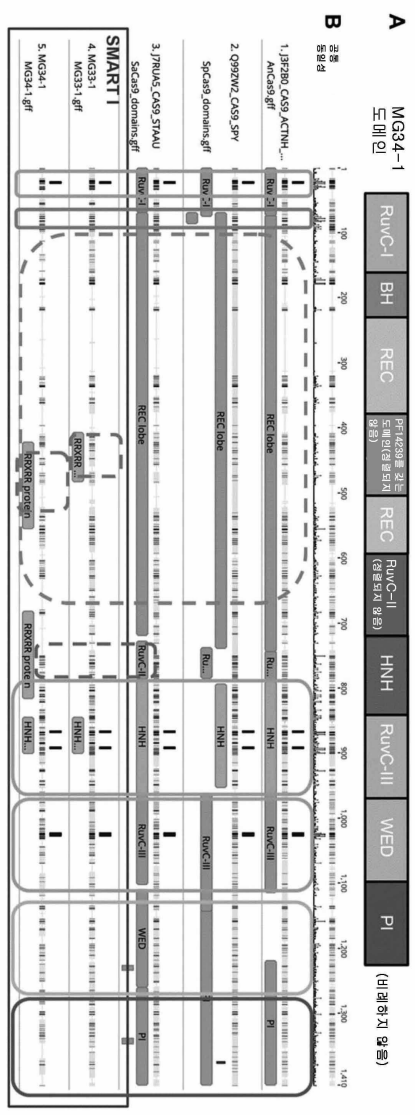
도면4a


A
공통
유일성
1. J7RUA5_CAS9_SaCas9 SaCas9.gff
RuvC1
Bridge helix
2. MG33-1
3. MG33-2
4. MG33-3
5. MG34-1
6. MG34-9
7. MG34-16
8. MG102-1
9. MG102-2
10. MG35-1
11. MG35-2
12. MG35-3
13. MG35-102
14. MG35-236
15. MG35-419
16. MG35-420
17. MG35-421
B
공통
유일성
1. J7RUA5_CAS9_SaCas9 SaCas9.gff
RuvCIII
2. MG33-1
3. MG33-2
4. MG33-3
5. MG34-1
6. MG34-9
7. MG34-16
8. MG102-1
9. MG102-2
10. MG35-1
11. MG35-2
12. MG35-3
13. MG35-102
14. MG35-236
15. MG35-419
16. MG35-420
17. MG35-421

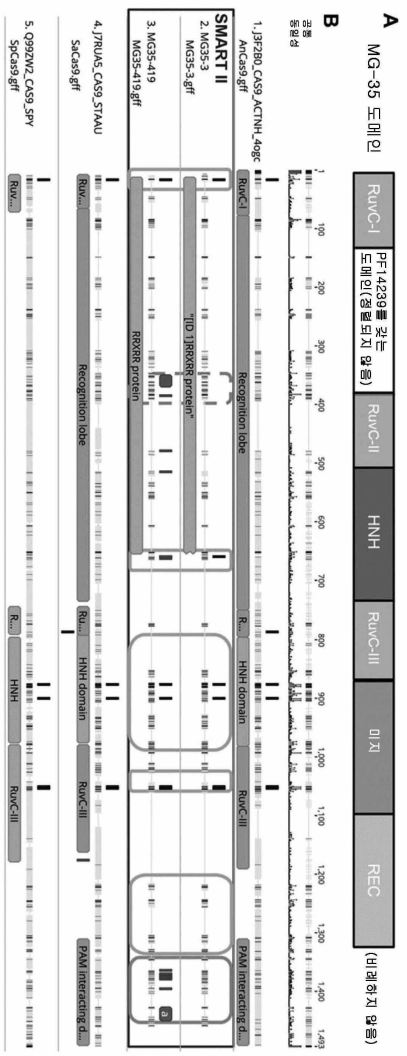
도면4b


C
RuvC-III
HNH domain
SaCas9.gff
1. J7RUA5_CAS9_SaCas9
2. MG33-1
3. MG33-2
4. MG33-3
5. MG34-1
6. MG34-9
7. MG34-16
8. MG102-1
9. MG102-2
10. MG35-1
11. MG35-2
12. MG35-3
13. MG35-102
14. MG35-236
15. MG35-419
16. MG35-420
17. MG35-421

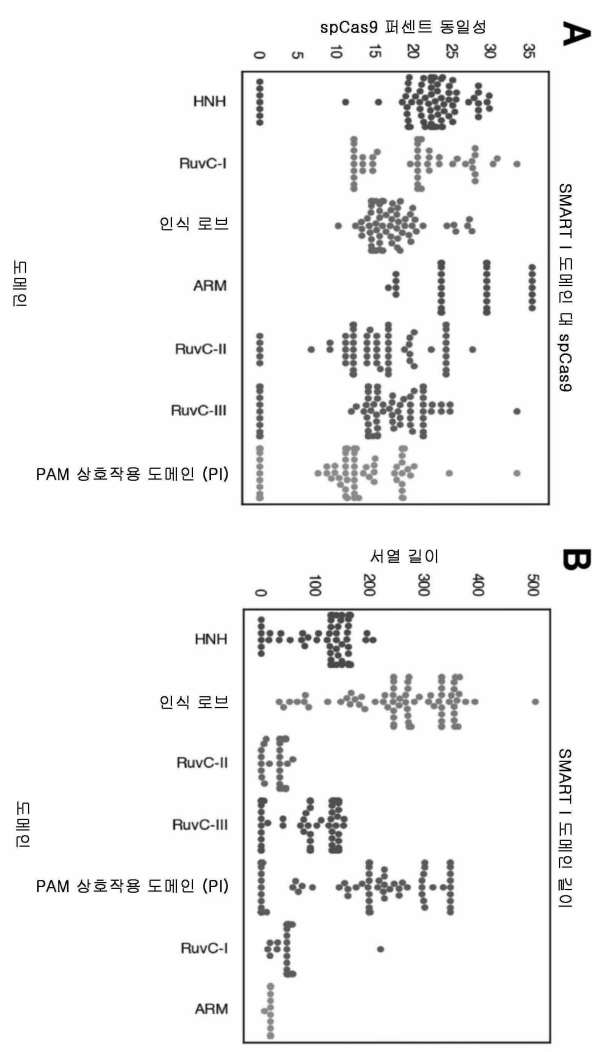
도면5


A
MG34-1
도메인
RuvC-I
BH
REC
REC
RuvC-II
HNH
RuvC-III
WED
PI
(비례하지 않음)
B
공통
동원성
SMART I
4.MG33-1
MG33-1.gff
5.MG34-1
MG34-1.gff
REC lobe
HNH
RuvC-III
WED
PI

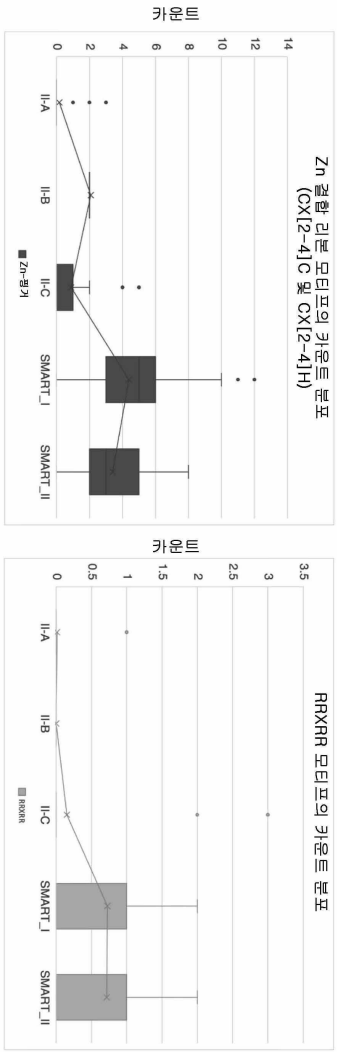
도면6


A
MG-35 도메인
RuvC-I
PF14239를 갖는 도메인(절단되지 않음)
RuvC-II
HNH
RuvC-III
미지
REC
(비례하지 않음)
B
1. J3F2B0_CAS9_ACTNH_4o9c
ArCas9.gff
RuvC-I
Recognition lobe
R...
HNH domain
RuvC-III
PAM interacting d...
SMART II
2. MG35-3
MG35-3.gff
ID: 1RRXRR protein"
3. MG35-419
MG35-419.gff
RRXRR protein
4. J7RUA5_CAS9_STAAU
SaCas9.gff
Ruv...
Recognition lobe
Ru...
HNH domain
RuvC-III
PAM interacting d...
5. Q99ZW2_CAS9_SPY
SpCas9.gff
Ruv...
R...
HNH
RuvC-III

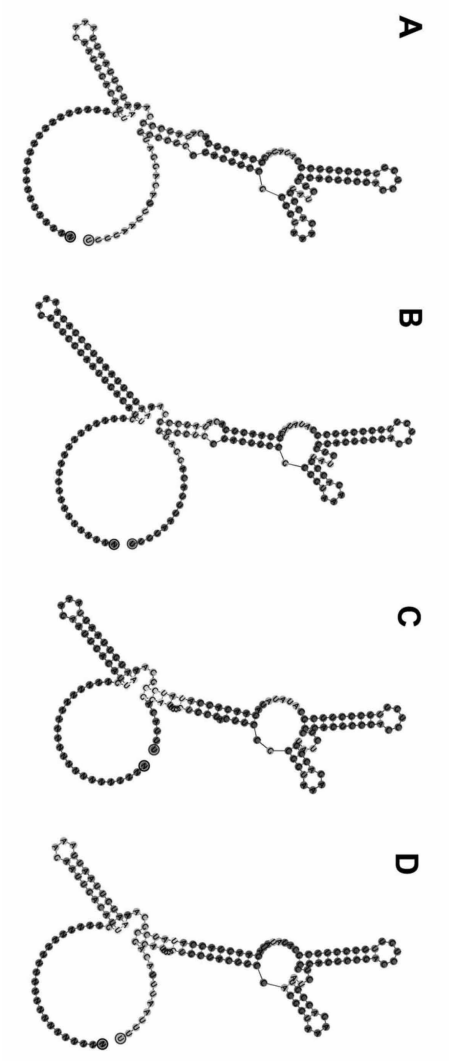
도면7


A
spCas9 퍼센트 동일성
0
5
10
15
20
25
30
35
HNH
RuvC-I
인식 로브
ARM
RuvC-II
RuvC-III
PAM 상호작용 도메인 (PI)
도메인
SMART I 도메인 대 spCas9
B
서열 길이
0
100
200
300
400
500
HNH
인식 로브
RuvC-II
RuvC-III
PAM 상호작용 도메인 (PI)
RuvC-I
ARM
도메인
SMART I 도메인 길이

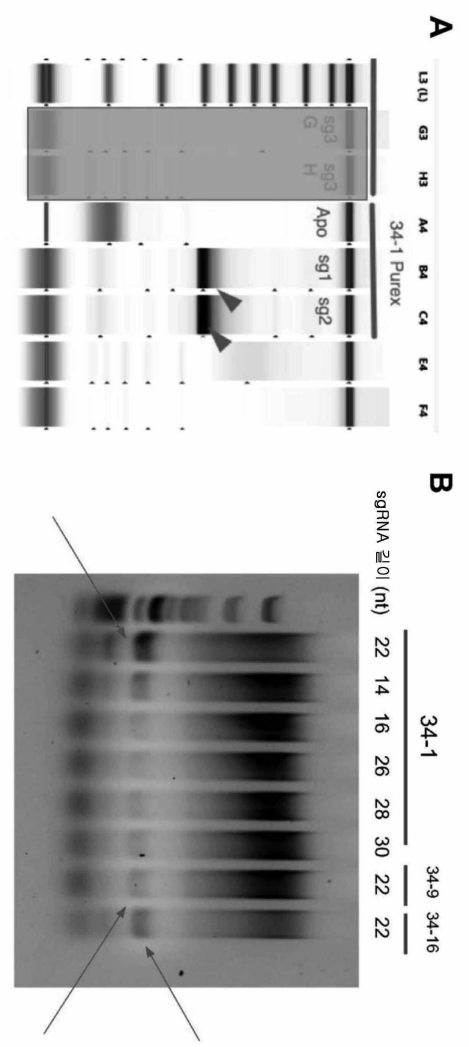
도면8


Zn 결합 리간드 모티프의 카운트 분포
(CX{2-4}C 및 CX{2-4}H)
카운트
0
2
4
6
8
10
12
14
II-A
II-B
II-C
SMART_I
SMART_II
Zn-결합
RRXRR 모티프의 카운트 분포
카운트
0
0.5
1
1.5
2
2.5
3
3.5
II-A
II-B
II-C
SMART_I
SMART_II
RRXRR

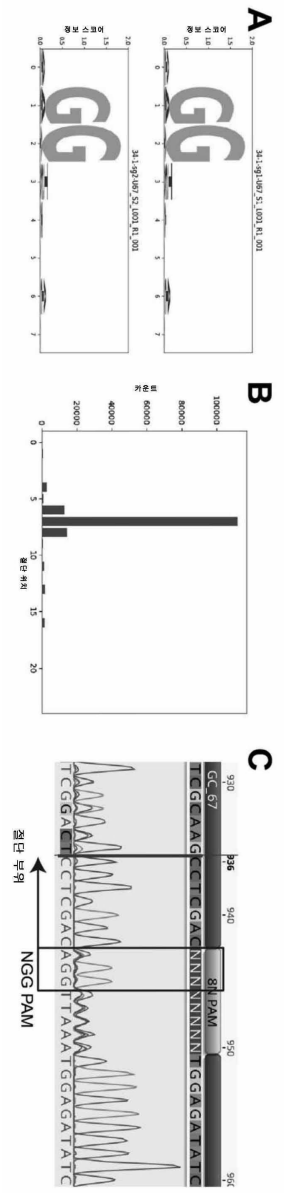
도면9



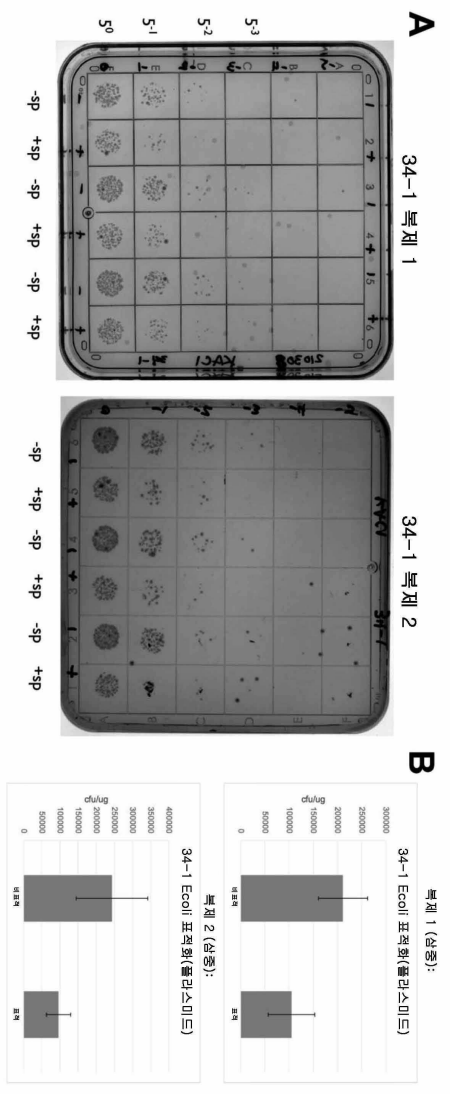
도면10


A
L3 (L)
G3
H3
A4
B4
C4
E4
F4
sg3 G
sg3 H
Apo
sg1
sg2
34-1 Purex
B
sgRNA 길이 (nt)
22
14
16
26
28
30
22
22
34-1
34-9
34-16

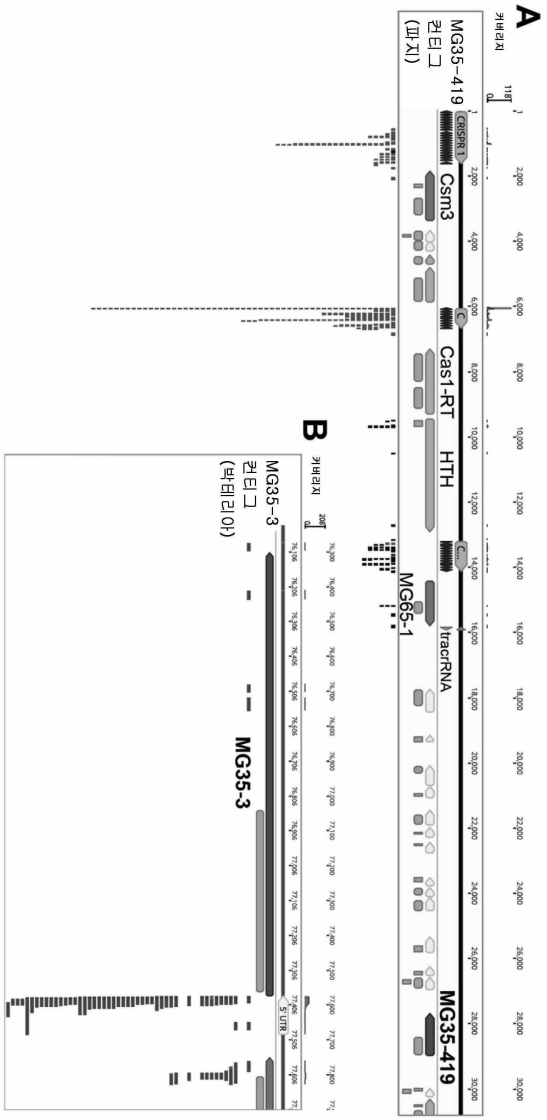
도면11



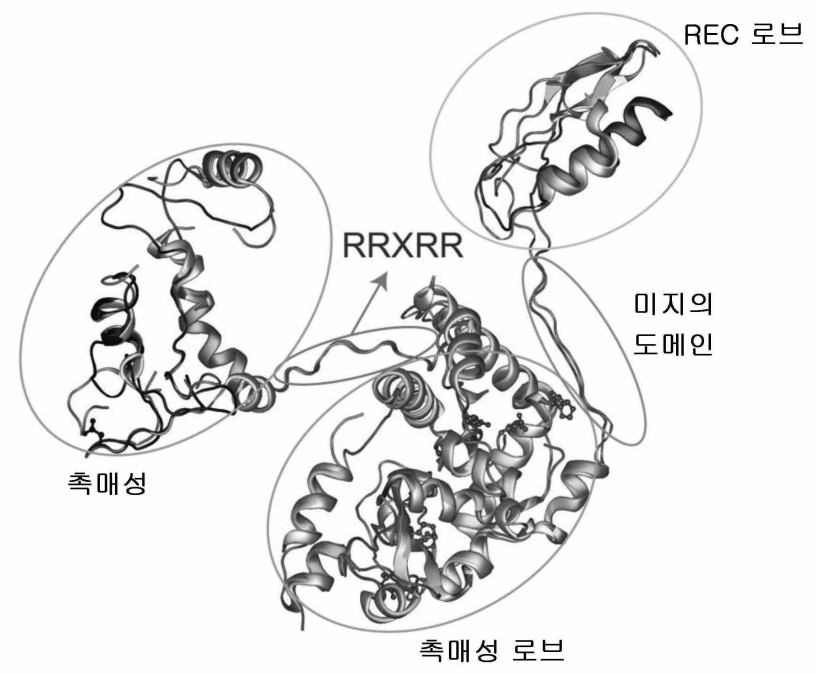
도면12


A
34-1 복제 1
34-1 복제 2
-sp
+sp
B
복제 1 (삼중):
34-1 Ecoli 표적화(콜리스미드)
복제 2 (삼중):
34-1 Ecoli 표적화(콜리스미드)
cfu/ug
비표적
표적

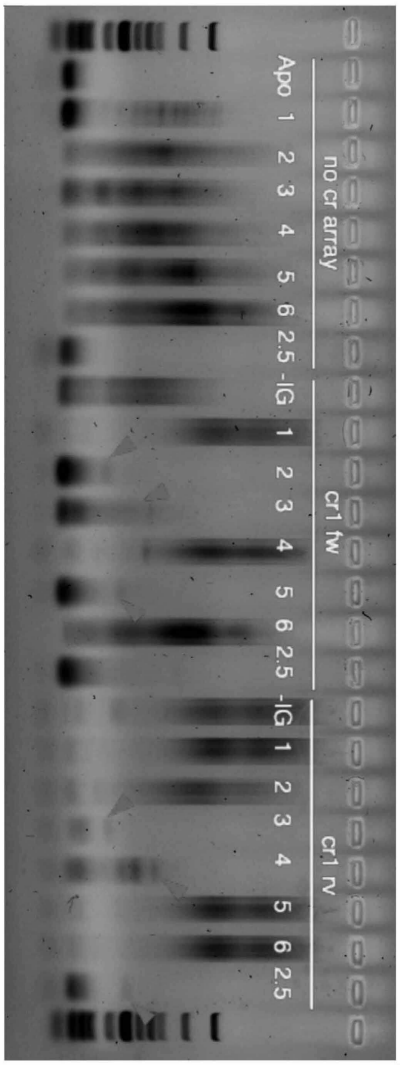
도면13


A
커버리지
MG35-419
컨티그
(파지)
CRISPR 1
Csm3
Cas1-RT
HTH
tracrRNA
MG35-419
MG65-1
B
커버리지
MG35-3
컨티그
(박테리아)
MG35-3

도면14



도면15



서 열 목 록

SEQUENCE LISTING

<110> METAGENOMI IP TECHNOLOGIES, LLC.

<120> CLASS II, TYPE II CRISPR SYSTEMS

<130> 55921-711.601

<140><141><150> 63/116,149

<151> 2020-11-19

<150> 63/003,159

<151> 2020-03-31

<160> 673

<170> PatentIn version 3.5

<210> 1

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<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG33 active effectors

<220><223> Description: MG33-1 effector

<400> 1

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1 5 10 15

Thr Leu Arg Leu Gly Leu Asp Leu Gly Glu Arg Ala Val Gly Ile Ala

20 25 30

Val Val Arg Gly Asn Glu Val Leu His Ala Glu Thr Val Ile Asp Phe

35 40 45

His Glu Ala Thr Leu Lys Glu Arg Arg Arg Leu Arg Arg Gly Arg Arg

50 55 60

Thr Arg Arg Ala Lys Lys Ser Arg Ile Ala Arg Leu Arg Ser Trp Ile

65 70 75 80

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

85 90 95

Met Arg Gln Lys Arg Phe Gln Cys Gln Pro Gly Glu Tyr Arg Gln Lys

100 105 110

Val Gln Leu Ala Lys Ser Ala Leu Pro Ser Trp Val Glu Ala Val Lys

115 120 125

Gln Gly Arg Glu Thr Ser Asp Glu Ala Phe Val Ile Ala Leu Thr His

130 135 140

Leu Phe Gln Lys Arg Gly Tyr Arg Trp Gly Gly Ser Asp Val Gln Ala

145 150 155 160

Met Asp Asp Asn Thr Leu Ala Asp Glu Leu Arg Lys Ile Arg Leu Thr

165 170 175

Pro Ala Val Ala Glu Gln Val Arg Arg Glu Val Glu Arg Arg Lys Asn

180 185 190

Asp Pro Asn Ala Pro Lys Gly Phe Thr Gly Lys Ile Asn Gly Ile Glu

195 200 205

Gln Leu Ile Glu Gln Ala Leu Asn Arg Arg Arg Gln Pro Arg Val Ala

210 215 220

Glu His Arg Ser Ile Val Glu Asp Glu Val Arg Ala Val Val Thr Ser

225 230 235 240

Phe Gly Arg His His Gly Ile Ala Glu Asp Thr Met Thr Arg Trp Arg

245 250 255

Ala Glu Leu Val Cys Leu Leu Asn Lys Pro Val Arg Ala Ala Arg Phe

260 265 270

Glu Asn Arg Ala Leu Thr Gly Cys Thr Trp Cys Gly Ala His Thr Pro

275 280 285

Lys Lys Ser Arg Pro Glu Val Gln Glu Leu Ala Tyr Trp Ala Ala Val

290 295 300

Ala Asn Val Arg Val Ala Ala Gly Arg Gln Pro Arg Pro Leu Thr Gln

305 310 315 320

Ser Glu Arg Ala Gln Phe Val Glu Trp Trp Asn Ala Asp Ala Gln Arg

325 330 335

Arg Pro Thr Gln Pro Ala Ile Lys Arg Tyr Leu Thr Ser Ile Gly Ala

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Gln Glu Glu Met Ala Arg Gln Phe Ala Asp Leu Leu Asn Arg Arg Asn

355 360 365

Leu Asn Gly Arg Thr Asn Leu Cys Leu Ala His Leu Arg Glu Gln Ala

370 375 380

Glu Gly Ala Phe Phe Cys Pro Gln His Gln Gly Val Cys Arg Ser Ala

385 390 395 400

Pro Asn Gly Gln His Arg Ala Val Glu Ser Ala Arg Ser Arg Glu Ser

405 410 415

Ser Ala Ser Arg Val Trp Asn Pro Ala Arg Ala Trp His Asp Arg Arg

420 425 430

Val Val Ala Arg Ile Glu Arg Met Leu Phe Met Arg Asp Gly Thr Pro

435 440 445

Arg Tyr Gly Gly Ile Pro Ser Leu Ile Thr Ile Glu Val Pro Lys Pro

450 455 460

Asp Thr Ala His Arg Tyr Glu Cys Pro His Cys His Glu Ala Leu Ala

465 470 475 480

Val Asn Leu Arg Val Arg Tyr Arg Ile Thr Lys Leu Glu Leu Lys Pro

485 490 495

Thr Lys Val Arg Gln Asn Glu Ala Ala Phe Thr Cys Pro Gln Cys Arg

500 505 510

Lys Pro Phe Glu Ile Asn Gly Lys Arg Lys Ile Gly Thr Pro Asn Gly

515 520 525

Leu Lys Pro Ile Asn Val Lys Leu Gly Leu Thr His Ala Val Val Trp

530 535 540

Trp Ala Gly Gly Gly Lys Lys Ala Arg His Val Ala Asp Thr Asn Gly

545 550 555 560

Gln Cys Ile Tyr Cys Gly Thr Asn Val Asp Val Gly Ser Val Lys Leu

565 570 575

Asp His Ile Phe Pro Gln Ser Met Ala Gly Pro Gly Ile Tyr Met Asn

580 585 590

Met Val Ala Ala Cys Glu Arg Cys Asn Asn Glu Lys Tyr Asn Arg Thr

595 600 605

Pro Trp Gln Trp Lys Gly His Asp Gln Ala Trp Trp Gln Ala Phe Glu

610 615 620

Ala Arg Leu Asp Arg Leu Phe Leu Pro Met Arg Lys Arg Glu Met Leu

625 630 635 640

Leu Ser Arg Glu Ala Ser Tyr Pro Glu Asn Pro Thr Ala Leu Ala Arg

645 650 655

Val Gly Gly Arg Ala Arg Glu Phe Met Arg Glu Leu Gln Val Met Phe

660 665 670

Ala Arg His Ala Ile Pro Ser Glu Arg Ile Val Thr Gly Tyr Arg His

675 680 685

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Asp Ala Asp Ile Val Met Gln Met Ile Glu Gly Trp Met Thr Asp Arg
    690                 695                 700
Leu Arg Arg Ser Trp Met Ser Gly Val Asp Gly Arg Glu Asn Phe Leu

705                 710                 715                 720
Pro Lys Asp Arg Ala Asp Leu Arg Asn His Ala Gln Asp Ala Val Leu
                725                 730                 735
Val Ala Ala Cys Pro Pro His Thr Trp Arg Glu Arg Ile Phe Cys Tyr
            740                 745                 750
Gly Pro Asp Arg Asp Met Ala Leu Pro Asp Leu Ala Pro Asn Trp Arg
        755                 760                 765
Asn Tyr Glu Ser Gly Met Arg Asp Arg His Pro Leu Val Val Pro Leu

    770                 775                 780
Gly Arg Tyr Arg Ile Arg Trp Arg Lys Gln Phe Leu Asp Gln Thr Phe
785                 790                 795                 800
Trp Lys Gln Pro Leu Gly Arg Lys Pro Val Val Tyr Arg Gln Leu Ala
                805                 810                 815
Glu Leu Lys Lys Ser Asp Ala Ser Ser Ile Lys Asp Glu Arg Ile Arg
            820                 825                 830
Cys Ala Phe Leu Ser Val Cys Gln Ala Tyr Asn Ile Gly Ser Glu Lys

        835                 840                 845
Thr Leu Thr Glu Asp Ala Gln Ala Asp Leu Gln Asn Arg Leu Val Ser
    850                 855                 860
Leu Gly Met Val Thr Pro Val Arg Arg Val Gln Cys Phe Ser Gln Lys
865                 870                 875                 880
Gly Gly Leu Pro Ile Ser Val Arg Pro His Asp Gly Pro Val Arg Ile
                885                 890                 895
Thr Gln Val Lys Pro Thr Ser Asp Gly Val Val Leu Trp Leu Pro Ala

            900                 905                 910
Gly Val Arg Leu Glu Thr Ala Arg Thr Arg Asp Leu Lys Ile Ser Val
        915                 920                 925
Ile Arg Pro Lys Pro Val Val Gly Trp Pro Ser Pro Asp Val Pro Gly
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930 935 940

Gln Ala Val Ser Glu Leu Asp Pro Pro Val Pro Pro Glu Ala Gln Arg

945 950 955 960

Ile Ala Thr Trp Tyr Arg Tyr Gln Cys Val Arg Phe Ser Pro His Asp

965 970 975

Gly Trp Tyr Arg Leu Lys Glu Phe Ser Glu Lys Lys Leu Thr Val Met

980 985 990

Pro Ala Ile Arg Leu Pro Lys Lys Leu Arg Asn Asp Ala Gly Gly His

995 1000 1005

Asp Gly Glu Glu Thr Gly Asn Asp Glu Arg Glu Phe Gly Lys Glu

1010 1015 1020

Ala Leu Leu Ala Ala Val Arg Ala Asn Ala Met Ala Thr Phe Cys

1025 1030 1035

Asp Pro Phe Asp

1040

<210> 2

<211> 747

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG34 active effectors

<220><223> Description: MG34-1 effector

<400> 2

Met Glu Arg Glu Leu Val Leu Gly Ile Asp Tyr Gly Gly Lys Tyr Thr

1 5 10 15

Gly Leu Ala Val Val Asp Arg Arg His Asn Gln Val Leu Tyr Ala Asn

20 25 30

Arg Leu Lys Met Arg Asp Asp Val Ala Gly Ile Leu Lys Asp Arg Arg

35 40 45

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

50 55 60

Arg Glu Leu Lys Asn Tyr Leu Lys Ser Ile Gly Tyr Asn Glu Ser Thr
65 70 75 80
Ala Thr Phe Glu Thr Val Tyr Ser Leu Ala His Lys Arg Gly Tyr Asp

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

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

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

275 280 285
Lys Thr Lys Ile Glu Asn Val Leu Ala Val Ile Lys Asp Glu Ile Leu
290 295 300
Pro Lys Phe Thr Val Asn Lys Val Val Met Glu Ser Asn Asn Phe Asp

305 310 315 320

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

325 330 335

Gly Lys Gly Pro Arg Glu Gly Lys Glu Thr Arg Lys Glu Ala Leu Leu

340 345 350

Arg Glu Thr Asp Gly Arg Cys Ile Tyr Cys Gly Lys Ser Ile Asp Ile

355 360 365

Ser Asn Ala His Asp Asp His Ile Phe Pro Arg Lys Ala Gly Gly Leu

370 375 380

Asn Ile Phe Ala Asn Leu Val Ala Cys Cys Ala Val Cys Asn Glu Asn

385 390 395 400

Lys Lys Gly Arg Thr Pro Leu Glu Ser Gly Ile Ser Pro Lys Pro Glu

405 410 415

Ile Ile Ala Phe Met Lys Asn Asp Leu Lys Lys Lys Ile Leu Glu Asp

420 425 430

Ala Arg Asn Ile Asn Thr Val Asp Phe Asn Lys Tyr Met Ser His Ala

435 440 445

Ser Ile Gly Trp Arg Tyr Met Arg Asp Arg Leu Arg Glu Ser Ala Gly

450 455 460

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

465 470 475 480

Phe Arg Arg Trp Trp Gly Phe Lys Lys Glu Arg Gly Asn Thr Leu His

485 490 495

His Ala Leu Asp Ala Val Ile Leu Ala Ser Arg Lys Gly Tyr Ser Asp

500 505 510

Asp Gly Leu Val Asp Met Thr Leu Lys Pro Lys Tyr Asn Lys Gly Gly

515 520 525

Glu Phe Asp Pro Glu Lys His Leu Pro Glu Pro Ile Glu Phe Lys Met

530 535 540

Asp Lys Gly Ser Arg Gly Ser Ala Leu His Asp Arg Asn Pro Leu Ser

545 550 555 560

Tyr Lys Lys Gly Ile Ile Thr Arg Arg Phe Met Val Thr Glu Ile Glu
565 570 575
Cys Gly Lys Glu Asp Asp Val Ile Ser Glu Thr Tyr Arg Glu Lys Leu
580 585 590
Lys Glu Ala Phe Lys Arg Phe Asp Thr Lys Lys Gly Lys Cys Leu Thr

595 600 605
Asp Lys Glu Ala Lys Glu Ala Gly Phe Cys Ile Lys Lys Asn Glu Leu
610 615 620
Val Met Ser Leu Lys Cys Ser Ile Lys Gly Thr Gly Pro Gly Gln Met
625 630 635 640
Ile Arg Ile Asn Asn Asn Val Phe Lys Thr Asn Val His Asn Val Gly
645 650 655
Val Asp Val Tyr Leu Asp Glu Lys Gly Lys Lys Lys Ala Tyr Glu Arg

660 665 670
Lys Asn Pro Arg Leu Ser Lys His Phe Ile Glu Pro Pro Pro Gln Pro
675 680 685
Asn Gly Arg Val Ser Phe Thr Leu Lys Arg Arg Asp Met Val Thr Val
690 695 700
Glu Gly Glu Asp Ala Ile Tyr Arg Ile Lys Lys Leu Gly Thr Ser Pro
705 710 715 720
Thr Ile Glu Ala Val Val Gly Ser Asp Gly Lys Thr Arg Thr Val Ser

725 730 735
Ala Thr Lys Leu Thr Lys Ala Asn Ser Ala Glu
740 745

<210> 3
<211> 145
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG34 effectors
<220><223> Description: MG34-2 effector

<400> 3

Ala Gly Phe Val Val Arg Lys Ser Gly Gln Met Met Ser Leu Lys Cys
1 5 10 15
Tyr Ala Asp Ile Arg Thr Asp Glu Thr Gly Lys Lys Gln Ser Leu Gly

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

85 90 95
Gly Asp Met Val Ser Val Glu Gly Glu Asp Thr Ile Tyr Arg Ile Lys
100 105 110
Lys Leu Gly Thr Ser Pro Val Ile Glu Lys Val Val Gly Ser Asp Gly
115 120 125
Lys Thr Arg Pro Val Ser Ala Thr Lys Leu Thr Lys Ala Asn Asn Ala
130 135 140
Glu
145

<210> 4

<211> 354

<212> PRT

<

213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG34 effectors

<220><223> Description: MG34-3 effector

<400> 4

Cys Asn Glu Gly Lys Arg Gly Arg Thr Pro Leu Glu Ser Gly Ile Leu
1 5 10 15

Pro Lys Pro Glu Ile Val Ser Phe Ile Thr Asn Asp Leu Lys Lys Lys
20 25 30
Ile Leu Glu Asp Ala Gln Tyr Ile Asn Thr Leu Asp Phe Asn Lys Tyr
35 40 45

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

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

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

Gly Tyr Asn Gln Met Ile Arg Ile Lys Asn Asn Ile Phe Lys Thr Asn
245 250 255
Val His Asn Val Gly Val Ala Val Phe Leu Asp Glu Lys Gly Lys Lys

260 265 270

Arg Ala Cys Glu Leu Lys Asn Pro Arg Leu Ser Lys His Phe Val Lys

275 280 285

Pro Ala Glu Gln Val Lys Gly Lys Val Ile Phe Ile Leu Lys Arg Gly

290 295 300

Asn Met Val Thr Val Glu Gly Glu Glu Met Ile Tyr Arg Val Lys Lys

305 310 315 320

Leu Gly Thr Ser Pro Val Ile Glu Ala Ile Val Gly Ser Asp Gly Lys

325 330 335

Thr Arg Thr Val Ser Ala Thr Lys Leu Leu Lys Ile Asn His Thr Lys

340 345 350

Lys Val

<210> 5

<211> 110

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG34 effectors

<220><223> Description: MG34-4 effector

<400> 5

Gly Gln Met Ile Arg Ile Asn Asn Asn Val Phe Lys Thr Asn Val His

1 5 10 15

Asn Val Gly Val Asp Val Tyr Leu Asp Glu Lys Gly Lys Lys Lys Ala

20 25 30

Tyr Glu Arg Lys His Pro Arg Leu Ser Lys His Phe Ile Glu Pro Pro

35 40 45

Pro Gln Pro Asn Gly Arg Val Ser Phe Thr Leu Lys Arg Arg Asp Met

50 55 60

Val Thr Val Glu Gly Glu Asp Ala Ile Tyr Arg Ile Lys Lys Leu Gly

65 70 75 80

Thr Ser Pro Thr Ile Glu Ala Val Val Gly Ser Asp Gly Lys Thr Arg
85 90 95
Thr Val Ser Ala Thr Lys Leu Thr Lys Ala Asn Ser Ala Glu
100 105 110

<210> 6

<211> 372

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG34 effectors

<220><223> Description: MG34-5 effector

<400> 6

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

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

Lys Lys Glu Arg Gly Asn Thr Leu His His Ala Leu Asp Ala Val Ile
115 120 125
Leu Ala Ser Arg Lys Gly Tyr Ser Asp Asp Gly Leu Val Asp Met Thr
130 135 140
Leu Lys Pro Lys Tyr Asn Lys Gly Gly Gly Phe Asp Ser Glu Lys His

145 150 155 160

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

165 170 175

Ala Leu His Asp Arg Asn Pro Leu Ser Tyr Lys Lys Gly Ile Ile Thr

180 185 190

Arg Arg Phe Met Val Thr Glu Ile Glu Cys Gly Lys Glu Asp Asp Val

195 200 205

Ile Ser Glu Thr Tyr Arg Glu Lys Leu Lys Glu Ala Phe Lys Arg Phe

210 215 220

Asp Thr Lys Lys Gly Lys Cys Leu Thr Asp Lys Glu Ala Lys Glu Ala

225 230 235 240

Gly Phe Cys Ile Lys Lys Asn Glu Leu Val Met Ser Leu Lys Cys Ser

245 250 255

Ile Lys Gly Thr Gly Pro Gly Gln Met Ile Arg Ile Asn Asn Asn Val

260 265 270

Phe Lys Thr Asn Val His Asn Val Gly Val Asp Val Tyr Leu Asp Glu

275 280 285

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

290 295 300

His Phe Ile Glu Pro Pro Pro Gln Pro Asn Gly Arg Val Ser Phe Thr

305 310 315 320

Leu Lys Arg Arg Asp Met Val Thr Val Glu Gly Glu Asp Thr Ile Tyr

325 330 335

Arg Ile Lys Lys Leu Gly Thr Ser Pro Thr Ile Glu Ala Val Val Gly

340 345 350

Ser Asp Gly Lys Thr Arg Thr Val Ser Ala Thr Lys Leu Thr Lys Ala

355 360 365

Asn Asn Ala Glu

370

<210> 7

<211> 119

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG34 effectors

<220><223> Description: MG34-6 effector

<400> 7

Lys Cys Ser Ile Lys Gly Thr Gly Pro Gly Gln Met Ile Arg Ile Asn
1 5 10 15

Asn Asn Val Phe Lys Thr Asn Val His Asn Val Gly Val Asp Val Tyr
20 25 30

Leu Asp Glu Lys Gly Lys Lys Lys Val Tyr Glu Arg Lys Asn Pro Arg
35 40 45

Leu Ser Lys His Phe Ile Glu Pro Leu Pro Gln Pro Asn Gly Arg Ala
50 55 60

Ser Phe Thr Leu Lys Arg Gly Asn Met Val Thr Val Glu Gly Glu Asp
65 70 75 80

Thr Ile Tyr Arg Ile Lys Lys Leu Gly Thr Ser Pro Thr Ile Glu Ala
85 90 95

Val Val Gly Ser Asp Gly Lys Thr Arg Thr Val Ser Ala Thr Lys Leu
100 105 110

Thr Lys Ala Asn Asn Ala Glu
115

<210> 8

<211> 400

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG34 effectors

<220><223> Description: MG34-7 effector

<400> 8

Lys Glu Ala Leu Leu Arg Glu Thr Asp Gly Arg Cys Ile Tyr Cys Gly

1 5 10 15

Lys Ser Ile Asp Ile Ser Asn Ala His Asp Asp His Ile Phe Pro Arg

20 25 30

Lys Ala Gly Gly Leu Asn Ile Phe Ala Asn Leu Val Ala Cys Cys Ala

35 40 45

Val Cys Asn Glu Asn Lys Lys Gly Arg Thr Pro Leu Glu Ser Gly Ile

50 55 60

Ser Pro Lys Pro Glu Ile Ile Ala Phe Met Lys Asn Asp Leu Lys Lys

65 70 75 80

Lys Ile Leu Glu Asp Ala Arg Asn Ile Asn Thr Val Asp Phe Asn Lys

85 90 95

Tyr Met Ser His Ala Ser Ile Gly Trp Arg Tyr Met Arg Asp Arg Leu

100 105 110

Arg Glu Ser Ala Gly Asn Lys Lys Leu Pro Ile Glu Arg Gln Ser Gly

115 120 125

Ile Tyr Thr Ala Tyr Phe Arg Arg Trp Trp Gly Phe Lys Lys Glu Arg

130 135 140

Gly Asn Thr Leu His His Ala Leu Asp Ala Val Ile Leu Ala Ser Arg

145 150 155 160

Lys Gly Tyr Ser Asp Asp Gly Leu Val Asp Met Thr Leu Lys Pro Lys

165 170 175

Tyr Asn Lys Gly Gly Gly Phe Asp Ser Glu Lys His Leu Pro Glu Pro

180 185 190

Ile Glu Phe Lys Arg Asp Lys Gly Ser Lys Gly Ser Ala Leu His Asp

195 200 205

Arg Asn Pro Leu Ser Tyr Lys Lys Gly Ile Ile Thr Arg Arg Phe Met

210 215 220

Val Thr Glu Ile Glu Cys Gly Lys Glu Asp Asp Val Ile Ser Glu Thr

225 230 235 240

Tyr Arg Glu Lys Leu Lys Glu Ala Phe Lys Arg Phe Asp Thr Lys Lys

245 250 255

Gly Lys Cys Leu Thr Asp Lys Glu Ala Lys Glu Ala Gly Phe Cys Ile
260 265 270
Lys Lys Asn Glu Leu Val Met Ser Leu Lys Cys Ser Ile Lys Gly Thr

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

340 345 350
Asp Met Val Ala Val Glu Gly Glu Asp Ala Ile Tyr Arg Ile Lys Lys
355 360 365
Leu Gly Thr Ser Pro Thr Ile Glu Ala Val Val Gly Ser Asp Gly Lys
370 375 380
Thr Arg Thr Val Ser Ala Thr Lys Leu Thr Lys Ala Asn Ser Ala Glu
385 390 395 400
<210> 9
<211> 402
<212> PRT
<213> Unknown

<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG34 effectors
<220><223> Description: MG34-8 effector
<400> 9
Lys Asn Tyr Leu Lys Ser Ile Gly Tyr Asn Glu Ser Thr Ala Thr Phe
1 5 10 15
Glu Thr Val Tyr Ser Leu Ala His Lys Arg Gly Tyr Asp Tyr Ala Asp
20 25 30
Met Pro Glu Glu Lys Thr Ser Glu Glu Ile Glu Ala Met Asp Val Glu

35 40 45

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

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

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

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

Asp Gly Arg Cys Ile Tyr Cys Gly Lys Ser Ile Asp Ile Ser Asn Ala
290 295 300

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

Ile Asn Thr Val Asp Phe Asn Lys Tyr Met Ser His Ala Ser Ile Gly
370 375 380
Trp Arg Tyr Met Arg Asp Arg Leu Arg Glu Ser Ala Gly Asn Lys Lys
385 390 395 400
Leu Ser

<210> 10
<211> 778
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG34 effectors
<220><223> Description: MG34-9 effector
<400> 10
Met Glu Arg Glu Ile Val Leu Gly Ile Asp Tyr Gly Gly Lys Tyr Thr

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

50 55 60

Arg Glu Leu Arg Asn Tyr Leu Lys Ser Ile Gly Tyr Asn Glu Ser Thr

65 70 75 80

Ala Thr Phe Lys Thr Val Tyr Ser Leu Ala His Lys Arg Gly Tyr Asp

85 90 95

Tyr Ala Asp Met Pro Glu Glu Lys Thr Ser Glu Lys Ile Glu Ala Met

100 105 110

Asp Glu Glu Glu Arg Lys Gln Trp Glu Lys Glu Lys Gln Glu Trp Glu

115 120 125

Glu Thr Lys Arg Asn Ser Arg His Arg Glu Glu Val Leu Lys Asp Val

130 135 140

Arg Lys Ala Met Thr Glu Gly Arg Ala Ala Glu Glu Gln Ile Lys Arg

145 150 155 160

Val Glu Ser Ile Phe Asn Lys Gln Tyr Arg Pro Lys Arg Phe Asn Asn

165 170 175

Arg Ile Leu Thr Lys Cys Lys Val Cys Gly Lys Asn Thr Pro Leu Arg

180 185 190

Arg Lys Val Arg Glu Leu Leu Leu Glu Asn Ile Val Arg Phe Leu Pro

195 200 205

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

210 215 220

Gln Gln Glu Asn Ile Asn Lys Ile Phe Arg Lys Leu Lys Phe Asn Gln

225 230 235 240

Lys Asp Trp Pro Gly Lys Asn Leu Thr Asp Ile Ala Lys Asn Lys Leu

245 250 255

Pro Gly Arg Leu Pro Phe Cys Lys Glu His Phe Ser Glu Asn Glu Lys

260 265 270

Phe Thr Met Ile Glu Lys Ser Thr Phe Arg Leu Ala Pro Ser Leu Lys

275 280 285

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

290 295 300

Lys Phe Thr Ile Asn Lys Val Val Met Glu Ser Asn Asn Phe Asp Ile
305 310 315 320
Ala Ala Lys Thr Gln Gly Lys Lys Arg Leu Ala Lys Glu Glu Tyr Gly

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

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

450 455 460
Gln Gln Val Asn Glu Leu Asp Phe Asn Lys Tyr Met Ser His Ala Ser
465 470 475 480
Ile Gly Trp Arg Tyr Met Arg Asp Arg Leu Arg Glu Ser Ala Gly Asn
485 490 495
Lys Lys Leu Pro Ile Glu Arg Gln Ser Gly Ile Tyr Thr Ala Tyr Phe
500 505 510
Arg Arg Trp Trp Gly Phe Lys Lys Glu Arg Gly Asn Thr Leu His His

515 520 525
Ala Leu Asp Ala Val Ile Leu Ala Ser Arg Lys Gly Tyr Ser Asp Asp
530 535 540
Gly Leu Val Asp Met Thr Leu Lys Pro Lys Tyr Asn Lys Gly Gly Glu

545 550 555 560

Phe Asp Pro Glu Lys His Ile Pro Glu Pro Ile Glu Phe Lys Arg Asp

565 570 575

Lys Gly Ser Lys Gly Ser Ala Leu His Asp Arg Asn Pro Leu Ser Tyr

580 585 590

Lys Lys Gly Ile Ile Thr Arg Arg Phe Met Val Thr Glu Ile Glu Cys

595 600 605

Gly Lys Glu Asp Asp Val Ile Ser Glu Thr Tyr Arg Glu Lys Leu Lys

610 615 620

Glu Ala Phe Lys Leu Phe Asp Thr Lys Lys Gly Lys Cys Leu Thr Asp

625 630 635 640

Lys Glu Ala Lys Glu Ala Gly Phe Cys Ile Lys Lys His Glu Leu Val

645 650 655

Met Ser Leu Lys Cys Ser Ile Lys Gly Thr Gly Pro Gly Gln Met Ile

660 665 670

Arg Ile Asn Asn Asn Val Phe Lys Thr Asn Val His Asn Val Gly Val

675 680 685

Asp Val Tyr Leu Asp Glu Lys Gly Lys Lys Lys Ala Tyr Glu Arg Lys

690 695 700

Asn Pro Arg Leu Ser Lys His Phe Ile Glu Pro Pro Pro Gln Pro Asn

705 710 715 720

Gly Arg Val Ser Phe Thr Leu Lys Arg Arg Asp Met Val Thr Val Glu

725 730 735

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

740 745 750

Ile Glu Ala Val Val Gly Ser Asp Gly Lys Thr Arg Thr Val Ser Ala

755 760 765

Thr Lys Leu Thr Lys Ala Asn Asn Ala Glu

770 775

<210> 11

<211> 754

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG34 effectors

<220><223> Description: MG34-10 effector

<400> 11

Met Glu Arg Glu Ile Val Leu Gly Ile Asp Tyr Gly Gly Lys Tyr Thr
1 5 10 15

Gly Leu Ala Val Val Asp Arg Arg His Asn Gln Val Leu Tyr Ala Asn
20 25 30

Arg Val Lys Met Arg Asp Asp Val Ala Asp Ile Leu Lys Gly Arg Arg
35 40 45

Glu Gln Arg Gly Ile Arg Arg Thr Ala Gln Thr Lys Lys Lys Arg Leu
50 55 60

Arg Glu Leu Arg Asn Tyr Leu Lys Ser Ile Gly Tyr Asn Glu Ser Thr
65 70 75 80

Ala Thr Phe Lys Thr Val Tyr Ser Leu Ala His Lys Arg Gly Tyr Asp
85 90 95

Tyr Ala Asp Met Pro Glu Glu Lys Thr Ser Glu Lys Ile Glu Ala Met
100 105 110

Asp Glu Glu Glu Arg Lys Gln Trp Glu Lys Glu Lys Gln Glu Trp Glu
115 120 125

Glu Thr Lys Arg Asn Ser Arg His Arg Glu Glu Val Leu Lys Asp Val
130 135 140

Arg Lys Ala Met Thr Glu Gly Arg Ala Ala Glu Glu Gln Ile Lys Arg
145 150 155 160

Val Glu Ser Ile Phe Asn Lys Gln Tyr Arg Pro Lys Arg Phe Asn Asn
165 170 175

Arg Ile Leu Thr Lys Cys Lys Val Cys Gly Lys Asn Thr Pro Leu Arg
180 185 190

Arg Lys Val Arg Glu Leu Leu Leu Glu Asn Ile Val Arg Phe Leu Pro

195 200 205

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

210 215 220

Gln Gln Glu Asn Ile Asn Lys Ile Phe Arg Lys Leu Lys Phe Asn Gln

225 230 235 240

Lys Asp Trp Pro Gly Lys Asn Leu Thr Asp Ile Ala Lys Asn Lys Leu

245 250 255

Pro Gly Arg Leu Pro Phe Cys Lys Glu His Phe Ser Glu Asn Glu Lys

260 265 270

Phe Thr Met Ile Glu Lys Ser Thr Phe Arg Leu Ala Pro Ser Leu Lys

275 280 285

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

290 295 300

Lys Phe Thr Ile Asn Lys Val Val Met Glu Ser Asn Asn Phe Asp Ile

305 310 315 320

Ala Ala Lys Thr Gln Gly Lys Lys Arg Leu Ala Lys Glu Glu Tyr Gly

325 330 335

Lys Gly Pro Arg Glu Gly Lys Glu Thr Arg Lys Glu Ala Leu Leu Arg

340 345 350

Glu Thr Asn Gly Arg Cys Ile Tyr Cys Gly Lys Ser Ile Asp Ile Ser

355 360 365

Asn Ala His Asp Asp His Ile Phe Pro Arg Lys Ser Gly Gly Leu Asn

370 375 380

Ile Phe Ala Asn Leu Val Ala Cys Cys Ala Val Cys Asn Glu Asn Lys

385 390 395 400

Lys Gly Arg Thr Pro Leu Glu Ser Gly Ile Leu Pro Lys Pro Asp Val

405 410 415

Ile Arg Phe Met Glu Asp Glu Phe Asn Arg Leu Lys Ile Lys Met Trp

420 425 430

Lys Ile Arg Arg Lys Gln Ser Leu Thr Thr Glu Glu Ile Met Asp Lys

435 440 445

Ala Lys Arg Asn Lys Leu Glu Leu Lys Leu Lys Ile Leu Glu Asp Ala
450 455 460
Gln Gln Val Asn Glu Leu Asp Phe Asn Lys Tyr Met Ser His Ala Ser
465 470 475 480
Ile Gly Trp Arg Tyr Met Arg Asp Arg Leu Arg Glu Ser Ala Gly Asn

485 490 495
Lys Lys Leu Pro Ile Glu Arg Gln Ser Gly Ile Tyr Thr Ala Tyr Phe
500 505 510
Arg Arg Trp Trp Gly Phe Lys Lys Glu Arg Gly Asn Thr Leu His His
515 520 525
Ala Leu Asp Ala Val Ile Leu Ala Ser Arg Lys Gly Tyr Ser Asp Asp
530 535 540
Gly Leu Val Asp Met Thr Leu Lys Pro Lys Tyr Asn Lys Gly Gly Glu

545 550 555 560
Phe Asp Pro Glu Lys His Ile Pro Glu Pro Ile Glu Phe Lys Arg Asp
565 570 575
Lys Gly Ser Lys Gly Ser Ala Leu His Asp Arg Asn Pro Leu Ser Tyr
580 585 590
Lys Lys Gly Ile Ile Thr Arg Arg Phe Met Val Thr Glu Ile Glu Cys
595 600 605
Gly Lys Glu Asp Asp Val Ile Ser Glu Thr Tyr Arg Glu Lys Leu Lys

610 615 620
Glu Ala Phe Lys Leu Phe Asp Thr Lys Lys Gly Lys Cys Leu Thr Asp
625 630 635 640
Lys Glu Ala Lys Glu Ala Gly Phe Cys Ile Lys Lys His Glu Leu Val
645 650 655
Met Ser Leu Lys Cys Ser Ile Lys Gly Thr Gly Pro Gly Gln Met Ile
660 665 670
Arg Ile Asn Asn Asn Val Phe Lys Thr Asn Val His Asn Val Gly Val

675 680 685
Asp Val Tyr Leu Asp Glu Lys Gly Lys Lys Lys Val Tyr Glu Arg Lys

690 695 700

Asn Pro Arg Leu Ser Lys His Phe Ile Glu Pro Pro Pro Gln Pro Asn

705 710 715 720

Gly Arg Val Ser Phe Thr Leu Lys Arg Arg Asp Met Val Thr Val Glu

725 730 735

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

740 745 750

Ile Glu

<210> 12

<211> 269

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG34 effectors

<220><223> Description: MG34-11 effector

<400> 12

Met Glu Arg Glu Leu Val Leu Gly Ile Asp Tyr Gly Gly Lys Tyr Thr

1 5 10 15

Gly Leu Ala Val Val Asp Arg Arg His Asn Gln Val Leu Tyr Ala Asn

20 25 30

Arg Leu Lys Met Arg Asp Asp Val Ala Gly Ile Leu Lys Asp Arg Arg

35 40 45

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

50 55 60

Arg Glu Leu Lys Asn Tyr Leu Lys Ser Ile Gly Tyr Asn Glu Ser Thr

65 70 75 80

Ala Thr Phe Glu Thr Val Tyr Ser Leu Ala His Lys Arg Gly Tyr Asp

85 90 95

Tyr Ala Asp Met Pro Glu Glu Lys Thr Ser Glu Glu Ile Glu Ala Met

100 105 110

Asp Val Glu Glu Arg Lys Gln Trp Glu Lys Glu Lys Gln Glu Trp Glu
115 120 125

Glu Thr Lys Arg Asn Ser Arg His Arg Glu Glu Val Leu Lys Asp Val
130 135 140

Arg Lys Ala Met Thr Glu Gly Arg Ala Ala Glu Glu Gln Ile Lys Arg
145 150 155 160

Val Glu Arg Ile Phe Asn Lys Gln Tyr Arg Pro Lys Arg Phe Asn Asn
165 170 175

Arg Ile Leu Thr Lys Cys Lys Val Glu Asp Cys Gly Val Asn Thr Pro
180 185 190

Leu Arg Lys Asn Val Arg Asp Leu Leu Ile Glu Asn Ile Val Arg Phe
195 200 205

Phe Pro Ile Glu Gln Ser Glu Lys Asp Asn Leu Lys Asp Ala Val Leu
210 215 220

Asp Lys Asn Arg Arg Glu Glu Val Lys Ser Phe Phe Arg Lys His Lys
225 230 235 240

Thr Asp Glu His Ile Arg Lys Gln Val Tyr Asp Ile Ala Asp Asn Lys
245 250 255

Leu Ser Gly Arg Thr Val Phe Phe Lys Glu His Ile Leu
260 265

<210> 13

<211> 337

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG34 effectors

<220><223> Description: MG34-12 effector

<400> 13

Met Glu Arg Glu Leu Val Leu Gly Ile Asp Tyr Gly Gly Lys Tyr Thr
1 5 10 15

Gly Leu Ala Val Val Asp Arg Arg His Asn Gln Val Leu Tyr Ala Asn

20 25 30

Arg Leu Lys Met Arg Asp Asp Val Ala Gly Ile Leu Lys Asp Arg Arg

35 40 45

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

50 55 60

Arg Glu Leu Lys Asn Tyr Leu Lys Ser Ile Gly Tyr Asn Glu Ser Thr

65 70 75 80

Ala Thr Phe Glu Thr Val Tyr Ser Leu Ala His Lys Arg Gly Tyr Asp

85 90 95

Tyr Ala Asp Met Pro Glu Glu Lys Thr Ser Glu Glu Ile Glu Ala Met

100 105 110

Asp Val Glu Glu Arg Lys Gln Trp Glu Lys Glu Lys Gln Glu Trp Glu

115 120 125

Glu Thr Lys Arg Asn Ser Arg His Arg Lys Glu Val Val Lys Asp Val

130 135 140

His Lys Ala Met Ile Glu Gly Arg Ala Thr Glu Glu Gln Ile Lys Arg

145 150 155 160

Val Glu Arg Ile Phe Asn Lys Gln Tyr Arg Pro Lys Arg Phe Asn Asn

165 170 175

Arg Ile Leu Thr Lys Cys Lys Val Glu Asp Cys Gly Val Asn Thr Pro

180 185 190

Leu Arg Lys Asn Val Arg Asp Leu Leu Ile Glu Asn Ile Val Arg Phe

195 200 205

Phe Pro Ile Glu Gln Ser Glu Lys Asp Asn Leu Lys Asp Ala Val Leu

210 215 220

Asp Lys Asn Arg Arg Glu Glu Val Lys Ser Phe Phe Arg Lys His Lys

225 230 235 240

Thr Asp Glu His Ile Arg Lys Gln Val Tyr Asp Ile Ala Asp Asn Lys

245 250 255

Leu Ser Gly Arg Thr Val Phe Cys Lys Glu His Ile Leu Glu His Thr

260 265 270

Glu His Ser Lys Glu Glu Arg Lys Val Phe Arg Leu Ala Pro Ser Leu
275 280 285
Lys Thr Lys Ile Glu Asn Val Leu Ala Val Ile Lys Asp Glu Ile Leu
290 295 300
Pro Lys Phe Thr Val Asn Lys Val Val Met Glu Ser Asn Asn Phe Asp

305 310 315 320
Ile Ala Ala Lys Thr Gln Gly Lys Lys Arg Leu Ala Lys Ala Glu Tyr
325 330 335
Val

<210> 14
<211> 530
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG34 effectors
<220><223> Description: MG34-13 effector
<400> 14
Met Glu Arg Glu Leu Val Leu Gly Ile Asp Tyr Gly Gly Lys Tyr Thr
1 5 10 15

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

Ala Thr Phe Glu Thr Val Tyr Ser Leu Ala His Lys Arg Gly Tyr Asp
85 90 95
Tyr Ala Asp Met Pro Glu Glu Lys Thr Ser Glu Glu Ile Glu Ala Met

100 105 110

Asp Val Glu Glu Arg Lys Gln Trp Glu Lys Glu Lys Gln Glu Trp Glu

115 120 125

Glu Thr Lys Arg Asn Ser Arg His Arg Lys Glu Val Val Lys Asp Val

130 135 140

His Lys Ala Met Ile Glu Gly Arg Ala Thr Glu Glu Gln Ile Lys Arg

145 150 155 160

Val Glu Arg Ile Phe Asn Lys Gln Tyr Arg Pro Lys Arg Phe Asn Asn

165 170 175

Arg Ile Leu Thr Lys Cys Lys Val Glu Asp Cys Gly Val Asn Thr Pro

180 185 190

Leu Arg Lys Asn Val Arg Asp Leu Leu Ile Glu Asn Ile Val Arg Phe

195 200 205

Phe Pro Ile Glu Gln Ser Glu Lys Asp Asn Leu Lys Asp Ala Val Leu

210 215 220

Asp Lys Asn Arg Arg Glu Glu Val Lys Ser Phe Phe Arg Lys His Lys

225 230 235 240

Thr Asp Glu His Ile Arg Lys Gln Val Tyr Asp Ile Ala Asp Asn Lys

245 250 255

Leu Ser Gly Arg Thr Val Phe Cys Lys Glu His Ile Leu Glu His Thr

260 265 270

Glu His Ser Lys Glu Glu Arg Lys Val Phe Arg Leu Ala Pro Ser Leu

275 280 285

Lys Thr Lys Ile Glu Asn Val Leu Ala Val Ile Lys Asp Glu Ile Leu

290 295 300

Pro Lys Phe Thr Val Asn Lys Val Val Met Glu Ser Asn Asn Phe Asp

305 310 315 320

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

325 330 335

Gly Lys Gly Pro Arg Glu Gly Lys Glu Thr Arg Lys Glu Ala Leu Leu

340 345 350

Arg Glu Thr Asp Asp Arg Cys Ile Tyr Cys Gly Lys Ser Ile Asp Ile
355 360 365

Ser Asn Ala His Asp Asp His Ile Phe Pro Arg Lys Ala Gly Gly Leu
370 375 380

Asn Ile Phe Ala Asn Leu Val Ala Cys Cys Ala Val Cys Asn Glu Asn
385 390 395 400

Lys Lys Gly Arg Thr Pro Leu Glu Ser Gly Ile Ser Pro Lys Pro Glu
405 410 415

Ile Ile Ala Phe Met Lys Asn Asp Leu Lys Lys Lys Ile Leu Glu Asp
420 425 430

Ala Arg Asn Ile Asn Thr Val Asp Phe Asn Lys Tyr Met Ser His Ala
435 440 445

Ser Ile Gly Trp Arg Tyr Met Arg Asp Arg Leu Arg Glu Ser Ala Gly
450 455 460

Asn Lys Lys Leu Pro Ile Glu Arg Gln Ser Gly Ile Tyr Thr Ala Tyr
465 470 475 480

Phe Arg Arg Trp Trp Gly Phe Lys Lys Glu Arg Gly Asn Thr Leu His
485 490 495

His Ala Leu Asp Ala Val Ile Leu Ala Ser Arg Lys Gly Tyr Ser Asp
500 505 510

Asp Gly Leu Val Asp Met Thr Leu Lys Pro Lys Tyr Asn Lys Gly Gly
515 520 525

Glu Phe
530

<210> 15

<211> 747

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG34 effectors

<220><223> Description: MG34-14 effector

<400> 15

Met Glu Arg Glu Leu Val Leu Gly Ile Asp Tyr Gly Gly Lys Tyr Thr
1 5 10 15

Gly Leu Ala Val Val Asp Arg Arg His Asn Gln Val Leu Tyr Ala Asn
20 25 30

Arg Leu Lys Met Arg Asp Asp Val Ala Gly Ile Leu Lys Asp Arg Arg
35 40 45

Lys Gln Arg Gly Ile Arg Arg Thr Ala Gln Thr Lys Lys Lys Arg Leu
50 55 60

Arg Glu Leu Lys Asn Tyr Leu Lys Ser Ile Gly Tyr Asn Glu Ser Thr
65 70 75 80

Ala Thr Phe Glu Thr Val Tyr Ser Leu Ala His Lys Arg Gly Tyr Asp
85 90 95

Tyr Ala Asp Met Pro Glu Glu Lys Thr Ser Glu Glu Ile Glu Ala Met
100 105 110

Asp Val Glu Glu Arg Lys Gln Trp Glu Lys Glu Lys Gln Glu Trp Glu
115 120 125

Glu Thr Lys Arg Asn Ser Arg His Arg Lys Glu Val Val Lys Asp Val
130 135 140

His Lys Ala Met Ile Glu Gly Arg Ala Thr Glu Glu Gln Ile Lys Arg
145 150 155 160

Val Glu Arg Ile Phe Asn Lys Gln Tyr Arg Pro Lys Arg Phe Asn Asn
165 170 175

Arg Ile Leu Thr Lys Cys Lys Val Glu Asp Cys Gly Val Asn Thr Pro
180 185 190

Leu Arg Lys Asn Val Arg Asp Leu Leu Ile Glu Asn Ile Val Arg Phe
195 200 205

Phe Pro Ile Glu Gln Ser Glu Lys Asp Asn Leu Lys Asp Ala Val Leu
210 215 220

Asp Lys Asn Arg Arg Glu Glu Val Lys Ser Phe Phe Arg Lys His Lys
225 230 235 240

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

290 295 300
Pro Lys Phe Thr Val Asn Lys Val Val Met Glu Ser Asn Asn Phe Asp
305 310 315 320
Ile Ala Ala Lys Thr Gln Gly Lys Lys Arg Leu Ala Lys Glu Glu Tyr
325 330 335
Gly Lys Gly Pro Arg Glu Gly Lys Glu Thr Arg Lys Glu Ala Leu Leu
340 345 350
Arg Glu Thr Asp Asp Arg Cys Ile Tyr Cys Gly Lys Ser Ile Asp Ile

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

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

485 490 495

His Ala Leu Asp Ala Val Ile Leu Ala Ser Arg Lys Gly Tyr Ser Asp

500 505 510

Asp Gly Leu Val Asp Met Thr Leu Lys Pro Lys Tyr Asn Lys Gly Gly

515 520 525

Gly Phe Asp Ser Glu Lys His Leu Pro Glu Pro Ile Glu Phe Lys Arg

530 535 540

Asp Lys Gly Ser Lys Gly Ser Ala Leu His Asp Arg Asn Pro Leu Ser

545 550 555 560

Tyr Lys Lys Gly Ile Ile Thr Arg Arg Phe Met Val Thr Glu Ile Glu

565 570 575

Cys Gly Lys Glu Asp Asp Val Ile Ser Glu Thr Tyr Arg Glu Lys Leu

580 585 590

Lys Glu Ala Phe Lys Arg Phe Asp Thr Lys Lys Gly Lys Cys Leu Thr

595 600 605

Asp Lys Glu Ala Lys Glu Ala Gly Phe Cys Ile Lys Lys Asn Glu Leu

610 615 620

Val Met Ser Leu Lys Cys Ser Ile Lys Gly Thr Gly Pro Gly Gln Met

625 630 635 640

Ile Arg Ile Asn Asn Asn Val Phe Lys Thr Asn Val His Asn Val Gly

645 650 655

Val Asp Val Tyr Leu Asp Glu Lys Gly Lys Lys Lys Val Tyr Glu Arg

660 665 670

Lys Asn Pro Arg Leu Ser Lys His Phe Ile Glu Pro Leu Pro Gln Pro

675 680 685

Asn Gly Arg Ala Ser Phe Thr Leu Lys Arg Arg Asp Met Val Thr Val

690 695 700

Glu Gly Glu Asp Thr Ile Tyr Arg Ile Lys Lys Leu Gly Thr Ser Pro

705 710 715 720

Thr Ile Glu Ala Val Val Gly Ser Asp Gly Lys Thr Arg Thr Val Ser

725 730 735

Ala Thr Lys Leu Thr Lys Ala Asn Asn Ala Glu

740 745

<210> 16

<211> 394

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG34 effectors

<220><223> Description: MG34-15 effector

<400> 16

Met Glu Arg Glu Leu Val Leu Gly Ile Asp Tyr Gly Gly Lys Tyr Thr
1 5 10 15

Gly Leu Ala Val Val Asp Arg Arg His Asn Gln Val Leu Tyr Ala Asn
20 25 30

Arg Leu Lys Met Arg Asp Asp Val Ala Gly Ile Leu Lys Asp Arg Arg
35 40 45

Lys Gln Arg Gly Ile Arg Arg Thr Ala Gln Thr Lys Lys Lys Arg Leu
50 55 60

Arg Glu Leu Lys Asn Tyr Leu Lys Ser Ile Gly Tyr Asn Glu Ser Thr
65 70 75 80

Ala Thr Phe Glu Thr Val Tyr Ser Leu Ala His Lys Arg Gly Tyr Asp
85 90 95

Tyr Ala Asp Met Pro Glu Glu Lys Thr Ser Glu Glu Ile Glu Ala Met
100 105 110

Asp Val Glu Glu Arg Lys Gln Trp Glu Lys Glu Lys Gln Glu Trp Glu
115 120 125

Glu Thr Lys Arg Asn Ser Arg His Arg Lys Glu Val Val Lys Asp Val
130 135 140

His Lys Ala Met Ile Glu Gly Arg Ala Thr Glu Glu Gln Ile Lys Arg
145 150 155 160

Val Glu Arg Ile Phe Asn Lys Gln Tyr Arg Pro Lys Arg Phe Asn Asn

165 170 175

Arg Ile Leu Thr Lys Cys Lys Val Glu Asp Cys Gly Val Asn Thr Pro

180 185 190

Leu Arg Lys Asn Val Arg Asp Leu Leu Ile Glu Asn Ile Val Arg Phe

195 200 205

Phe Pro Ile Glu Gln Ser Glu Lys Asp Asn Leu Lys Asp Ala Val Leu

210 215 220

Asp Lys Asn Arg Arg Glu Glu Val Lys Ser Phe Phe Arg Lys His Lys

225 230 235 240

Thr Asp Glu His Ile Arg Lys Gln Val Tyr Asp Ile Ala Asp Asn Lys

245 250 255

Leu Ser Gly Arg Thr Val Phe Cys Lys Glu His Ile Leu Glu His Thr

260 265 270

Glu His Ser Lys Glu Glu Arg Lys Val Phe Arg Leu Ala Pro Ser Leu

275 280 285

Lys Thr Lys Ile Glu Asn Val Leu Ala Val Ile Lys Asp Glu Ile Leu

290 295 300

Pro Lys Phe Thr Val Asn Lys Val Val Met Glu Ser Asn Asn Phe Asp

305 310 315 320

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

325 330 335

Gly Lys Gly Pro Arg Glu Gly Lys Glu Thr Arg Lys Glu Ala Leu Leu

340 345 350

Arg Glu Thr Asp Gly Arg Cys Ile Tyr Cys Gly Lys Ser Ile Asp Ile

355 360 365

Ser Asn Ala His Asp Asp His Ile Phe Pro Arg Lys Ala Gly Gly Leu

370 375 380

Asn Ile Phe Ala Asn Leu Val Ala Cys Cys

385 390

<210> 17

<211> 747

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG34 effectors

<220><223> Description: MG34-16 effector

<400> 17

Met Glu Arg Glu Leu Val Leu Gly Ile Asp Tyr Gly Gly Lys Tyr Thr

1 5 10 15

Gly Leu Ala Val Val Asp Arg Arg His Asn Gln Val Leu Tyr Ala Asn

20 25 30

Arg Leu Lys Met Arg Asp Asp Val Ala Gly Ile Leu Lys Asp Arg Arg

35 40 45

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

50 55 60

Arg Glu Leu Lys Asn Tyr Leu Lys Ser Ile Gly Tyr Asn Glu Ser Thr

65 70 75 80

Ala Thr Phe Glu Thr Val Tyr Ser Leu Ala His Lys Arg Gly Tyr Asp

85 90 95

Tyr Ala Asp Met Pro Glu Glu Lys Thr Ser Glu Glu Ile Glu Ala Met

100 105 110

Asp Val Glu Glu Arg Lys Gln Trp Glu Lys Glu Lys Gln Glu Trp Glu

115 120 125

Glu Thr Lys Arg Asn Ser Arg His Arg Lys Glu Val Val Lys Asp Val

130 135 140

His Lys Ala Met Ile Glu Gly Arg Ala Thr Glu Glu Gln Ile Lys Arg

145 150 155 160

Val Glu Arg Ile Phe Asn Lys Gln Tyr Arg Pro Lys Arg Phe Asn Asn

165 170 175

Arg Ile Leu Thr Lys Cys Lys Val Glu Asp Cys Gly Val Asn Thr Pro

180 185 190

Leu Arg Lys Asn Val Arg Asp Leu Leu Ile Glu Asn Ile Val Arg Phe

195 200 205

Phe Pro Ile Glu Gln Ser Glu Lys Asp Asn Leu Lys Asp Ala Val Leu

210 215 220

Asp Lys Asn Arg Arg Glu Glu Val Lys Ser Phe Phe Arg Lys His Lys

225 230 235 240

Thr Asp Glu His Ile Arg Lys Gln Val Tyr Asp Ile Ala Asp Asn Lys

245 250 255

Leu Ser Gly Arg Thr Val Phe Cys Lys Glu His Ile Leu Glu His Thr

260 265 270

Glu His Ser Lys Glu Glu Arg Lys Val Phe Arg Leu Ala Pro Ser Leu

275 280 285

Lys Thr Lys Ile Glu Asn Val Leu Ala Val Ile Lys Asp Glu Ile Leu

290 295 300

Pro Lys Phe Thr Val Asn Lys Val Val Met Glu Ser Asn Asn Phe Asp

305 310 315 320

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

325 330 335

Gly Lys Gly Pro Arg Glu Gly Lys Glu Thr Arg Lys Glu Ala Leu Leu

340 345 350

Arg Glu Thr Asp Gly Arg Cys Ile Tyr Cys Gly Lys Ser Ile Asp Ile

355 360 365

Ser Asn Ala His Asp Asp His Ile Phe Pro Arg Lys Ala Gly Gly Leu

370 375 380

Asn Ile Phe Ala Asn Leu Val Ala Cys Cys Ala Val Cys Asn Glu Asn

385 390 395 400

Lys Lys Gly Arg Thr Pro Leu Glu Ser Gly Ile Ser Pro Lys Pro Glu

405 410 415

Ile Ile Ala Phe Met Lys Asn Asp Leu Lys Lys Lys Ile Leu Glu Asp

420 425 430

Ala Arg Asn Ile Asn Thr Val Asp Phe Asn Lys Tyr Met Ser His Ala

435 440 445

Ser Ile Gly Trp Arg Tyr Met Arg Asp Arg Leu Arg Glu Ser Ala Gly

450 455 460

Asn Lys Lys Leu Pro Ile Glu Arg Gln Ser Gly Ile Tyr Thr Ala Tyr
465 470 475 480

Phe Arg Arg Trp Trp Gly Phe Lys Lys Glu Arg Gly Asn Thr Leu His
485 490 495

His Ala Leu Asp Ala Val Ile Leu Ala Ser Arg Lys Gly Tyr Ser Asp
500 505 510

Asp Gly Leu Val Asp Met Thr Leu Lys Pro Lys Tyr Asn Lys Gly Gly

515 520 525

Gly Phe Asp Ser Glu Lys His Leu Pro Glu Pro Ile Glu Phe Lys Arg
530 535 540

Asp Lys Gly Ser Lys Gly Ser Ala Leu His Asp Arg Asn Pro Leu Ser
545 550 555 560

Tyr Lys Lys Gly Ile Ile Thr Arg Arg Phe Met Val Thr Glu Ile Glu
565 570 575

Cys Gly Lys Glu Asp Asp Val Ile Ser Glu Thr Tyr Arg Glu Lys Leu

580 585 590

Lys Glu Ala Phe Lys Arg Phe Asp Thr Lys Lys Gly Lys Cys Leu Thr
595 600 605

Asp Lys Glu Ala Lys Glu Ala Gly Phe Cys Ile Lys Lys Asn Glu Leu
610 615 620

Val Met Ser Leu Lys Cys Ser Ile Lys Gly Thr Gly Pro Gly Gln Met
625 630 635 640

Ile Arg Ile Asn Asn Asn Val Phe Lys Thr Asn Val His Asn Val Gly

645 650 655

Val Asp Val Tyr Leu Asp Glu Lys Gly Lys Lys Lys Val Tyr Glu Arg

660 665 670

Lys Asn Pro Arg Leu Ser Lys His Phe Ile Glu Pro Leu Pro Gln Pro

675 680 685

Asn Gly Arg Ala Ser Phe Thr Leu Lys Arg Gly Asn Met Val Thr Val

690 695 700

Glu Gly Glu Asp Thr Ile Tyr Arg Ile Lys Lys Leu Gly Thr Ser Pro

705 710 715 720

Thr Ile Glu Ala Val Val Gly Ser Asp Gly Lys Thr Arg Thr Val Ser

725 730 735

Ala Thr Lys Leu Thr Lys Ala Asn Asn Ala Glu

740 745

<210> 18

<211> 747

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG34 effectors

<220><223> Description: MG34-17 effector

<400> 18

Met Glu Arg Glu Leu Val Leu Gly Ile Asp Tyr Gly Gly Lys Tyr Thr

1 5 10 15

Gly Leu Ala Val Val Asp Arg Arg His Asn Gln Val Leu Tyr Ala Asn

20 25 30

Arg Leu Lys Met Arg Asp Asp Val Ala Gly Ile Leu Lys Asp Arg Arg

35 40 45

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

50 55 60

Arg Glu Leu Lys Asn Tyr Leu Lys Ser Ile Gly Tyr Asn Glu Ser Thr

65 70 75 80

Ala Thr Phe Glu Thr Val Tyr Ser Leu Ala His Lys Arg Gly Tyr Asp

85 90 95

Tyr Ala Asp Met Pro Glu Glu Lys Thr Ser Glu Glu Ile Glu Ala Met

100 105 110

Asp Val Glu Glu Arg Lys Gln Trp Glu Lys Glu Lys Gln Glu Trp Glu

115 120 125

Glu Thr Lys Arg Asn Ser Arg His Arg Lys Glu Val Val Lys Asp Val

130 135 140

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

195 200 205

Phe Pro Ile Glu Gln Ser Glu Lys Asp Asn Leu Lys Asp Ala Val Leu
210 215 220
Asp Lys Asn Arg Arg Glu Glu Val Lys Ser Phe Phe Arg Lys His Lys
225 230 235 240
Thr Asp Glu His Ile Arg Lys Gln Val Tyr Asp Ile Ala Asp Asn Lys
245 250 255
Leu Ser Gly Arg Thr Val Phe Cys Lys Glu His Ile Leu Glu His Thr

260 265 270

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

325 330 335

Gly Lys Gly Pro Arg Glu Gly Lys Glu Thr Arg Lys Glu Ala Leu Leu
340 345 350
Arg Glu Thr Asp Gly Arg Cys Ile Tyr Cys Gly Lys Ser Ile Asp Ile
355 360 365
Ser Asn Ala His Asp Asp His Ile Phe Pro Arg Lys Ala Gly Gly Leu

370 375 380

Asn Ile Phe Ala Asn Leu Val Ala Cys Cys Ala Val Cys Asn Glu Asn

385 390 395 400

Lys Lys Gly Arg Thr Pro Leu Glu Ser Gly Ile Ser Pro Lys Pro Glu

405 410 415

Ile Ile Ala Phe Met Lys Asn Asp Leu Lys Lys Lys Ile Leu Glu Asp

420 425 430

Ala Arg Asn Ile Asn Thr Val Asp Phe Asn Lys Tyr Met Ser His Ala

435 440 445

Ser Ile Gly Trp Arg Tyr Met Arg Asp Arg Leu Arg Glu Ser Ala Gly

450 455 460

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

465 470 475 480

Phe Arg Arg Trp Trp Gly Phe Lys Lys Glu Arg Gly Asn Thr Leu His

485 490 495

His Ala Leu Asp Ala Val Ile Leu Ala Ser Arg Lys Gly Tyr Ser Asp

500 505 510

Asp Gly Leu Val Asp Met Thr Leu Lys Pro Lys Tyr Asn Lys Gly Gly

515 520 525

Gly Phe Asp Ser Glu Lys His Leu Pro Glu Pro Ile Glu Phe Lys Arg

530 535 540

Asp Lys Gly Ser Lys Gly Ser Ala Leu His Asp Arg Asn Pro Leu Ser

545 550 555 560

Tyr Lys Lys Gly Ile Ile Thr Arg Arg Phe Met Val Thr Glu Ile Glu

565 570 575

Cys Gly Lys Glu Asp Asp Val Ile Ser Glu Thr Tyr Arg Glu Lys Leu

580 585 590

Lys Glu Ala Phe Lys Arg Phe Asp Thr Lys Lys Gly Lys Cys Leu Thr

595 600 605

Asp Lys Glu Ala Lys Glu Ala Gly Phe Cys Ile Lys Lys Asn Glu Leu

610 615 620

Val Met Ser Leu Lys Cys Ser Ile Lys Gly Thr Gly Pro Gly Gln Met
625 630 635 640
Ile Arg Ile Asn Asn Asn Val Phe Lys Thr Asn Val His Asn Val Gly

645 650 655
Val Asp Val Tyr Leu Asp Glu Lys Gly Lys Lys Lys Ala Tyr Glu Arg
660 665 670
Lys Asn Pro Arg Leu Ser Lys His Phe Ile Glu Pro Pro Pro Gln Pro
675 680 685
Asn Gly Arg Val Ser Phe Thr Leu Lys Arg Arg Asp Met Val Thr Val
690 695 700
Glu Gly Glu Asp Ala Ile Tyr Arg Ile Lys Lys Leu Gly Thr Ser Pro

705 710 715 720
Thr Ile Glu Ala Val Val Gly Ser Asp Gly Lys Thr Arg Thr Val Ser
725 730 735
Ala Thr Lys Leu Thr Lys Ala Asn Ser Ala Glu
740 745

<210> 19
<211> 457
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG34 effectors
<220><223> Description: MG34-18 effector
<400> 19
Met Glu Arg Glu Leu Val Leu Gly Ile Asp Tyr Gly Gly Lys Tyr Thr

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

50 55 60

Arg Glu Leu Lys Asn Tyr Leu Lys Ser Ile Gly Tyr Asn Glu Ser Thr

65 70 75 80

Ala Thr Phe Glu Thr Val Tyr Ser Leu Ala His Lys Arg Gly Tyr Asp

85 90 95

Tyr Ala Asp Met Pro Glu Glu Lys Thr Ser Glu Glu Ile Glu Ala Met

100 105 110

Asp Val Glu Glu Arg Lys Gln Trp Glu Lys Glu Lys Gln Glu Trp Glu

115 120 125

Glu Thr Lys Arg Asn Ser Arg His Arg Lys Glu Val Val Lys Asp Val

130 135 140

His Lys Ala Met Ile Glu Gly Arg Ala Thr Glu Glu Gln Ile Lys Arg

145 150 155 160

Val Glu Arg Ile Phe Asn Lys Gln Tyr Arg Pro Lys Arg Phe Asn Asn

165 170 175

Arg Ile Leu Thr Lys Cys Lys Val Glu Asp Cys Gly Val Asn Thr Pro

180 185 190

Leu Arg Lys Asn Val Arg Asp Leu Leu Ile Glu Asn Ile Val Arg Phe

195 200 205

Phe Pro Ile Glu Gln Ser Glu Lys Asp Asn Leu Lys Asp Ala Val Leu

210 215 220

Asp Lys Asn Arg Arg Glu Glu Val Lys Ser Phe Phe Arg Lys His Lys

225 230 235 240

Thr Asp Glu His Ile Arg Lys Gln Val Tyr Asp Ile Ala Asp Asn Lys

245 250 255

Leu Ser Gly Arg Thr Val Phe Cys Lys Glu His Ile Leu Glu His Thr

260 265 270

Glu His Ser Lys Glu Glu Arg Lys Val Phe Arg Leu Ala Pro Ser Leu

275 280 285

Lys Thr Lys Ile Glu Asn Val Leu Ala Val Ile Lys Asp Glu Ile Leu

290 295 300

Pro Lys Phe Thr Val Asn Lys Val Val Met Glu Ser Asn Asn Phe Asp
305 310 315 320
Ile Ala Ala Lys Thr Gln Gly Lys Lys Arg Leu Ala Lys Glu Glu Tyr

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

385 390 395 400
Lys Lys Gly Arg Thr Pro Leu Glu Ser Gly Ile Leu Pro Lys Pro Glu
405 410 415
Ile Ile Ala Ile Ile Lys Asn Asp Leu Lys Lys Lys Ile Leu Glu Asp
420 425 430
Ala Arg Asn Ile Asn Thr Val Asp Phe Asn Lys Tyr Met Ser His Ala
435 440 445
Ser Ile Gly Trp Arg Tyr Met Arg Asp
450 455

<210> 20
<211> 747
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG34 effectors
<220><223> Description: MG34-19 effector
<400> 20
Met Glu Arg Glu Leu Val Leu Gly Ile Asp Tyr Gly Gly Lys Tyr Thr
1 5 10 15
Gly Leu Ala Val Val Asp Arg Arg His Asn Gln Val Leu Tyr Ala Asn

20 25 30

Arg Leu Lys Met Arg Asp Asp Val Ala Gly Ile Leu Lys Asp Arg Arg

35 40 45

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

50 55 60

Arg Glu Leu Lys Asn Tyr Leu Lys Ser Ile Gly Tyr Asn Glu Ser Thr

65 70 75 80

Ala Thr Phe Glu Thr Val Tyr Ser Leu Ala His Lys Arg Gly Tyr Asp

85 90 95

Tyr Ala Asp Met Pro Glu Glu Lys Thr Ser Glu Glu Ile Glu Ala Met

100 105 110

Asp Val Glu Glu Arg Lys Gln Trp Glu Lys Glu Lys Gln Glu Trp Glu

115 120 125

Glu Thr Lys Arg Asn Ser Arg His Arg Lys Glu Val Val Lys Asp Val

130 135 140

His Lys Ala Met Ile Glu Gly Arg Ala Thr Glu Glu Gln Ile Lys Arg

145 150 155 160

Val Glu Arg Ile Phe Asn Lys Gln Tyr Arg Pro Lys Arg Phe Asn Asn

165 170 175

Arg Ile Leu Thr Lys Cys Lys Val Glu Asp Cys Gly Val Asn Thr Pro

180 185 190

Leu Arg Lys Asn Val Arg Asp Leu Leu Ile Glu Asn Ile Val Arg Phe

195 200 205

Phe Pro Ile Glu Gln Ser Glu Lys Asp Asn Leu Lys Asp Ala Val Leu

210 215 220

Asp Lys Asn Arg Arg Glu Glu Val Lys Ser Phe Phe Arg Lys His Lys

225 230 235 240

Thr Asp Glu His Ile Arg Lys Gln Val Tyr Asp Ile Ala Asp Asn Lys

245 250 255

Leu Ser Gly Arg Thr Val Phe Cys Lys Glu His Ile Leu Glu His Thr

260 265 270

Glu His Ser Lys Glu Glu Arg Lys Val Phe Arg Leu Ala Pro Ser Leu
275 280 285
Lys Thr Lys Ile Glu Asn Val Leu Ala Val Ile Lys Asp Glu Ile Leu

290 295 300
Pro Lys Phe Thr Val Asn Lys Val Val Met Glu Ser Asn Asn Phe Asp
305 310 315 320
Ile Ala Ala Lys Thr Gln Gly Lys Lys Arg Leu Ala Lys Glu Glu Tyr
325 330 335
Gly Lys Gly Pro Arg Glu Gly Lys Glu Thr Arg Lys Glu Ala Leu Leu
340 345 350
Arg Glu Thr Asp Gly Arg Cys Ile Tyr Cys Gly Lys Ser Ile Asp Ile

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

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

485 490 495
His Ala Leu Asp Ala Val Ile Leu Ala Ser Arg Lys Gly Tyr Ser Asp
500 505 510
Asp Gly Leu Val Asp Met Thr Leu Lys Pro Lys Tyr Asn Lys Gly Gly

515 520 525

Glu Phe Asp Pro Glu Lys His Leu Pro Glu Pro Ile Glu Phe Lys Met

530 535 540

Asp Lys Gly Ser Arg Gly Ser Ala Leu His Asp Arg Asn Pro Leu Ser

545 550 555 560

Tyr Lys Lys Gly Ile Ile Thr Arg Arg Phe Met Val Thr Glu Ile Glu

565 570 575

Cys Gly Lys Glu Asp Asp Val Ile Ser Glu Thr Tyr Arg Glu Lys Leu

580 585 590

Lys Glu Ala Phe Lys Arg Phe Asp Thr Lys Lys Gly Lys Cys Leu Thr

595 600 605

Asp Lys Glu Ala Lys Glu Ala Gly Phe Cys Ile Lys Lys Asn Glu Leu

610 615 620

Val Met Ser Leu Lys Cys Ser Ile Lys Gly Thr Gly Pro Gly Gln Met

625 630 635 640

Ile Arg Ile Asn Asn Asn Val Phe Lys Thr Asn Val His Asn Val Gly

645 650 655

Val Asp Val Tyr Leu Asp Glu Lys Gly Lys Lys Lys Val Tyr Glu Arg

660 665 670

Lys Asn Pro Arg Leu Ser Lys His Phe Ile Glu Pro Leu Pro Gln Pro

675 680 685

Asn Gly Arg Ala Ser Phe Thr Leu Lys Arg Gly Asn Met Val Thr Val

690 695 700

Glu Gly Glu Asp Thr Ile Tyr Arg Ile Lys Lys Leu Gly Thr Ser Pro

705 710 715 720

Thr Ile Glu Ala Val Val Gly Ser Asp Gly Lys Thr Arg Thr Val Ser

725 730 735

Ala Thr Lys Leu Thr Lys Ala Asn Asn Ala Glu

740 745

<210> 21

<211> 747

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG34 effectors

<220><223> Description: MG34-20 effector

<400> 21

Met Glu Arg Glu Leu Val Leu Gly Ile Asp Tyr Gly Gly Lys Tyr Thr
1 5 10 15

Gly Leu Ala Val Val Asp Arg Arg His Asn Gln Val Leu Tyr Ala Asn
20 25 30

Arg Leu Lys Met Arg Asp Asp Val Ala Gly Ile Leu Lys Asp Arg Arg
35 40 45

Lys Gln Arg Gly Ile Arg Arg Thr Ala Gln Thr Lys Lys Lys Arg Leu
50 55 60

Arg Glu Leu Lys Asn Tyr Leu Lys Ser Ile Gly Tyr Asn Glu Ser Thr
65 70 75 80

Ala Thr Phe Glu Thr Val Tyr Ser Leu Ala His Lys Arg Gly Tyr Asp
85 90 95

Tyr Ala Asp Met Pro Glu Glu Lys Thr Ser Glu Glu Ile Glu Ala Met
100 105 110

Asp Val Glu Glu Arg Lys Gln Trp Glu Lys Glu Lys Gln Glu Trp Glu
115 120 125

Glu Thr Lys Arg Asn Ser Arg His Arg Lys Glu Val Val Lys Asp Val
130 135 140

His Lys Ala Met Ile Glu Gly Arg Ala Thr Glu Glu Gln Ile Lys Arg
145 150 155 160

Val Glu Arg Ile Phe Asn Lys Gln Tyr Arg Pro Lys Arg Phe Asn Asn
165 170 175

Arg Ile Leu Thr Lys Cys Lys Val Glu Asp Cys Gly Val Asn Thr Pro
180 185 190

Leu Arg Lys Asn Val Arg Asp Leu Leu Ile Glu Asn Ile Val Arg Phe

195 200 205

Phe Pro Ile Glu Gln Ser Glu Lys Asp Asn Leu Lys Asp Ala Val Leu

210 215 220

Asp Lys Asn Arg Arg Glu Glu Val Lys Ser Phe Phe Arg Lys His Lys

225 230 235 240

Thr Asp Glu His Ile Arg Lys Gln Val Tyr Asp Ile Ala Asp Asn Lys

245 250 255

Leu Ser Gly Arg Thr Val Phe Cys Lys Glu His Ile Leu Glu His Thr

260 265 270

Glu His Ser Lys Glu Glu Arg Lys Val Phe Arg Leu Ala Pro Ser Leu

275 280 285

Lys Thr Lys Ile Glu Asn Val Leu Ala Val Ile Lys Asp Glu Ile Leu

290 295 300

Pro Lys Phe Thr Val Asn Lys Val Val Met Glu Ser Asn Asn Phe Asp

305 310 315 320

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

325 330 335

Gly Lys Gly Pro Arg Glu Gly Lys Glu Thr Arg Lys Glu Ala Leu Leu

340 345 350

Arg Glu Thr Asp Gly Arg Cys Ile Tyr Cys Gly Lys Ser Ile Asp Ile

355 360 365

Ser Asn Ala His Asp Asp His Ile Phe Pro Arg Lys Ala Gly Gly Leu

370 375 380

Asn Ile Phe Ala Asn Leu Val Ala Cys Cys Thr Val Cys Asn Glu Asn

385 390 395 400

Lys Lys Gly Arg Thr Pro Leu Glu Ser Gly Ile Leu Pro Lys Pro Glu

405 410 415

Ile Ile Ala Ile Ile Lys Asn Asp Leu Lys Lys Lys Ile Leu Glu Asp

420 425 430

Ala Arg Asn Ile Asn Thr Val Asp Phe Asn Lys Tyr Met Ser His Ala

435 440 445

Ser Ile Gly Trp Arg Tyr Met Arg Asp Arg Leu Arg Glu Ser Ala Gly

450 455 460

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

465 470 475 480

Phe Arg Arg Trp Trp Gly Phe Lys Lys Glu Arg Gly Asn Thr Leu His

485 490 495

His Ala Leu Asp Ala Val Ile Leu Ala Ser Arg Lys Gly Tyr Ser Asp

500 505 510

Asp Gly Leu Val Asp Met Thr Leu Lys Pro Lys Tyr Asn Lys Gly Gly

515 520 525

Glu Phe Asp Pro Glu Lys His Leu Pro Glu Pro Ile Glu Phe Lys Arg

530 535 540

Asp Lys Gly Ser Lys Gly Ser Ala Leu His Asp Arg Asn Pro Leu Ser

545 550 555 560

Tyr Lys Lys Gly Ile Ile Thr Arg Arg Phe Met Val Thr Glu Ile Glu

565 570 575

Cys Gly Lys Glu Asp Asp Val Ile Ser Glu Thr Tyr Arg Glu Lys Leu

580 585 590

Lys Glu Ala Phe Lys Arg Phe Asp Thr Lys Lys Gly Lys Cys Leu Thr

595 600 605

Asp Lys Glu Ala Lys Glu Ala Gly Phe Cys Ile Lys Lys Asn Glu Leu

610 615 620

Val Met Ser Leu Lys Cys Ser Ile Lys Gly Thr Gly Pro Gly Gln Met

625 630 635 640

Ile Arg Ile Asn Asn Asn Val Phe Lys Thr Asn Val His Asn Val Gly

645 650 655

Val Asp Val Tyr Leu Asp Glu Lys Gly Lys Lys Lys Val Tyr Glu Arg

660 665 670

Lys Asn Pro Arg Leu Ser Lys His Phe Ile Glu Pro Leu Pro Gln Pro

675 680 685

Asn Gly Arg Ala Ser Phe Thr Leu Lys Arg Gly Asn Met Val Thr Val

690 695 700

Glu Gly Glu Asp Thr Ile Tyr Arg Ile Lys Lys Leu Gly Thr Ser Pro

705 710 715 720

Thr Ile Glu Ala Val Val Gly Ser Asp Gly Lys Thr Arg Thr Val Ser

725 730 735

Ala Thr Lys Leu Thr Lys Ala Asn Asn Ala Glu

740 745

<210> 22

<211> 434

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG34 effectors

<220><223> Description: MG34-21 effector

<400> 22

Met Glu Ser Asn Asn Phe Asp Ile Ala Ala Lys Thr Gln Gly Lys Lys

1 5 10 15

Arg Leu Ala Lys Glu Glu Tyr Gly Lys Gly Pro Arg Glu Gly Lys Glu

20 25 30

Thr Arg Lys Glu Ala Leu Leu Arg Glu Thr Asp Gly Arg Cys Ile Tyr

35 40 45

Cys Gly Lys Ser Ile Asp Ile Ser Asn Ala His Asp Asp His Ile Phe

50 55 60

Pro Arg Lys Ala Gly Gly Leu Asn Ile Phe Ala Asn Leu Val Ala Cys

65 70 75 80

Cys Thr Val Cys Asn Glu Asn Lys Lys Gly Arg Thr Pro Leu Glu Ser

85 90 95

Gly Ile Leu Pro Lys Pro Glu Ile Ile Ala Ile Ile Lys Asn Asp Leu

100 105 110

Lys Lys Lys Ile Leu Glu Asp Ala Arg Asn Ile Asn Thr Val Asp Phe

115 120 125

Asn Lys Tyr Met Ser His Ala Ser Ile Gly Trp Arg Tyr Met Arg Asp
130 135 140
Arg Leu Arg Glu Ser Ala Gly Asn Lys Lys Leu Ser Ile Glu Arg Gln
145 150 155 160
Ser Gly Ile Tyr Thr Ala Tyr Phe Arg Arg Trp Trp Gly Phe Lys Lys

165 170 175
Glu Arg Gly Asn Thr Leu His His Ala Leu Asp Ala Val Ile Leu Ala
180 185 190
Ser Arg Lys Gly Tyr Ser Asp Asp Gly Leu Val Asp Met Thr Leu Lys
195 200 205
Pro Lys Tyr Asn Lys Gly Gly Glu Phe Asp Pro Glu Lys His Ile Pro
210 215 220
Glu Pro Ile Glu Phe Lys Arg Asp Lys Gly Ser Lys Gly Ser Ala Leu

225 230 235 240
His Asp Arg Asn Pro Leu Ser Tyr Lys Lys Gly Ile Ile Thr Arg Arg
245 250 255
Phe Met Val Thr Glu Ile Glu Cys Gly Lys Glu Asp Asp Val Ile Ser
260 265 270
Glu Thr Tyr Arg Glu Lys Leu Lys Glu Ala Phe Lys Leu Phe Asp Thr
275 280 285
Lys Lys Gly Lys Cys Leu Thr Asp Lys Glu Ala Lys Glu Ala Gly Phe

290 295 300
Cys Ile Lys Lys Asn Glu Leu Val Met Ser Leu Lys Cys Ser Ile Lys
305 310 315 320
Gly Thr Gly Pro Gly Gln Met Ile Arg Ile Asn Asn Asn Val Phe Lys
325 330 335
Thr Asn Val His Asn Val Gly Val Asp Val Tyr Leu Asp Glu Lys Gly
340 345 350
Lys Lys Lys Ala Tyr Glu Arg Lys Asn Pro Arg Leu Ser Lys His Phe

355 360 365
Ile Glu Pro Pro Pro Gln Pro Asn Gly Arg Val Ser Phe Thr Leu Lys

370 375 380

Arg Arg Asp Met Val Thr Val Glu Gly Glu Asp Ala Ile Tyr Arg Ile

385 390 395 400

Lys Lys Leu Gly Thr Ser Pro Thr Ile Glu Ala Val Val Gly Ser Asp

405 410 415

Gly Lys Thr Arg Thr Val Ser Ala Thr Lys Leu Thr Lys Ala Asn Asn

420 425 430

Ala Glu

<210> 23

<211> 443

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG34 effectors

<220><223> Description: MG34-22 effector

<400> 23

Gln Trp Glu Lys Glu Lys Gln Glu Trp Glu Glu Thr Lys Arg Asn Ser

1 5 10 15

Arg His Arg Glu Glu Val Leu Lys Asp Val Arg Lys Ala Met Thr Glu

20 25 30

Gly Arg Ala Ala Glu Glu Gln Ile Lys Arg Val Glu Ser Ile Phe Asn

35 40 45

Lys Gln Tyr Arg Pro Lys Arg Phe Asn Asn Arg Ile Leu Thr Lys Cys

50 55 60

Lys Val Cys Gly Lys Asn Thr Pro Leu Arg Arg Lys Val Arg Glu Leu

65 70 75 80

Leu Leu Glu Asn Ile Val Arg Phe Leu Pro Leu Glu Ser Glu Met Lys

85 90 95

Glu Thr Leu Lys Gln Thr Ile Leu Glu Gly Gln Gln Glu Asn Ile Asn

100 105 110

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

Ser Thr Phe Arg Leu Ala Pro Ser Leu Lys Thr Lys Ile Glu Asn Val
165 170 175
Leu Ala Val Ile Lys Asp Glu Ile Leu Pro Lys Phe Thr Ile Asn Lys
180 185 190
Val Val Met Glu Ser Asn Asn Phe Asp Ile Ala Ala Lys Thr Gln Gly
195 200 205
Lys Lys Arg Leu Ala Lys Glu Glu Tyr Gly Lys Gly Pro Arg Glu Gly
210 215 220

Lys Glu Thr Arg Lys Glu Ala Leu Leu Arg Glu Thr Asn Gly Arg Cys
225 230 235 240
Ile Tyr Cys Gly Lys Ser Ile Asp Ile Ser Asn Ala His Asp Asp His
245 250 255
Ile Phe Pro Arg Lys Ser Gly Gly Leu Asn Ile Phe Ala Asn Leu Val
260 265 270
Ala Cys Cys Ala Val Cys Asn Glu Asn Lys Lys Gly Arg Thr Pro Leu
275 280 285

Glu Ser Gly Ile Leu Pro Lys Pro Asp Val Ile Arg Phe Met Glu Asp
290 295 300
Glu Phe Asn Arg Leu Lys Ile Lys Met Trp Lys Ile Arg Arg Lys Gln
305 310 315 320
Ser Leu Thr Thr Glu Glu Ile Met Asp Lys Ala Lys Arg Asn Lys Leu
325 330 335
Glu Leu Lys Leu Lys Ile Leu Glu Asp Ala Gln Gln Val Asn Glu Leu
340 345 350

Asp Phe Asn Lys Tyr Met Ser His Ala Ser Ile Gly Trp Arg Tyr Met

355 360 365

Arg Asp Arg Leu Arg Glu Ser Ala Gly Asn Lys Lys Leu Pro Ile Glu

370 375 380

Arg Gln Ser Gly Ile Tyr Thr Ala Tyr Phe Arg Arg Trp Trp Gly Phe

385 390 395 400

Lys Lys Glu Arg Gly Asn Thr Leu His His Ala Leu Asp Ala Val Ile

405 410 415

Leu Ala Ser Arg Lys Gly Tyr Ser Asp Asp Gly Leu Val Asp Met Thr

420 425 430

Leu Lys Pro Lys Tyr Asn Lys Gly Gly Glu Phe

435 440

<210> 24

<211> 264

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG34 effectors

<220><223> Description: MG34-23 effector

<400> 24

Trp Trp Gly Phe Lys Lys Glu Arg Gly Asn Thr Leu His His Ala Leu

1 5 10 15

Asp Ala Val Ile Leu Ala Ser Arg Lys Gly Tyr Ser Asp Asp Gly Leu

20 25 30

Val Asp Met Thr Leu Lys Pro Lys Tyr Asn Lys Gly Gly Glu Phe Asp

35 40 45

Pro Glu Lys His Ile Pro Glu Pro Ile Glu Phe Lys Arg Asp Lys Gly

50 55 60

Ser Lys Gly Ser Ala Leu His Asp Arg Asn Pro Leu Ser Tyr Lys Lys

65 70 75 80

Gly Ile Ile Thr Arg Arg Phe Met Val Thr Glu Ile Glu Cys Gly Lys

85 90 95

Glu Asp Asp Val Ile Ser Glu Thr Tyr Arg Glu Lys Leu Lys Glu Ala
100 105 110
Phe Lys Arg Phe Asp Thr Lys Lys Gly Lys Cys Leu Thr Asp Lys Glu
115 120 125
Ala Lys Glu Ala Gly Phe Cys Ile Lys Lys Asn Glu Leu Val Met Ser
130 135 140

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

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

<210> 25
<211> 428
<212> PRT
<213> Unknown

<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-1 effector
<400> 25
Met Gln Arg Val Phe Val Leu Asp His Asn Lys Gln Pro Leu Met Pro

1 5 10 15

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

20 25 30

Val Tyr Arg Arg Tyr Pro Phe Ala Ile Ile Met Thr His Arg Val Gly

35 40 45

Gly Asp Leu Gln Thr Val Glu Ile Lys Phe Asp Pro Gly Ser Arg Thr

50 55 60

Thr Gly Ile Ala Leu Val Gly Asp Phe Asp Arg Gly Lys Glu Val Ile

65 70 75 80

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

85 90 95

Asn Ser Arg Arg Ala Ile Arg Arg Ala Arg Arg Asn Arg Lys Thr Arg

100 105 110

Tyr Arg Gln Ala Arg Phe Asn Asn Arg Arg Arg Pro Lys Gly Trp Leu

115 120 125

Pro Pro Ser Leu Arg Ser Arg Val Asp Asn Thr Lys Asn Trp Met His

130 135 140

Lys Leu Ala Arg Leu Ala Pro Leu Thr Gln Ile Ala Val Glu Thr Val

145 150 155 160

Arg Phe Asp Thr Gln Lys Leu Gln Lys Pro Glu Ile Ser Gly Val Glu

165 170 175

Tyr Gln Gln Gly Glu Leu Ala Gly Tyr Glu Leu Arg Glu Tyr Leu Leu

180 185 190

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

195 200 205

Leu Glu Ile Glu His Ile Gln Ala Arg Ser Lys Gly Gly Ser Asp Arg

210 215 220

Val Ser Asn Leu Thr Leu Ala Cys Thr Pro Cys Asn Ile Asp Lys Gly

225 230 235 240

Asn Lys Asp Ile Lys Glu Phe Leu Ser Leu Lys Pro Lys Arg Leu Lys

245 250 255

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

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

Gln Thr Gly Asp Ile Val Lys Ala Ile Val Thr Lys Gly Lys Lys Ile
370 375 380
Gly Thr Tyr Ile Gly Arg Val Val Val Arg Ser Arg Gly Ser Phe Asp
385 390 395 400
Ile Gly Ser Gly Glu Lys Lys Val Gly Ser Ile Ser Tyr Lys Tyr Cys
405 410 415
Gln Leu Leu Gln Arg Ala Asp Gly Tyr Glu Tyr Thr
420 425

<210> 26

<211

> 494

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-2 effector

<400> 26

Met Asp Met Val Tyr Val Leu Asn Lys Asp Gly Lys Pro Leu Met Ala

1 5 10 15

Thr Thr Arg Gly Gly Arg Val Arg Tyr Leu Leu Lys Glu Lys Lys Ala

20 25 30

Arg Val Val Ser Ser Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr

35 40 45

Pro Asp Ala Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr

50 55 60

Asn Ile Gly Val Ala Val Val Lys Glu Asp Gly Gln Cys Val Phe Ser

65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Glu Val Pro Leu Leu Met Lys Lys

85 90 95

Arg Ala Ala Phe Arg Arg Gln His Arg Thr Gln Asp Arg Arg Arg Lys

100 105 110

Arg Gln Arg Arg Ala Ile Ala Ala Gly Thr Thr Val Glu Ser Asn Thr

115 120 125

Ile Glu Arg Leu Leu Pro Gly Tyr Glu Lys Pro Ile Val Cys His His

130 135 140

Ile Arg Asn Lys Glu Ala Arg Phe Asn Asn Arg Ser Arg Pro Ala Gly

145 150 155 160

Trp Leu Thr Pro Thr Ala Asn His Leu Leu Gln Ala His Ile Asn Leu

165 170 175

Ile Ala Lys Ala Ala Lys Phe Leu Pro Ile Thr Lys Val Val Val Glu

180 185 190

Leu Asn Arg Phe Ala Phe Met Ala Met Asp Asn Pro Asn Ile Arg Arg

195 200 205

Trp Glu Tyr Gln Gln Gly Pro Leu Tyr Gly Leu Gly Ser Val Lys Asp

210 215 220

Ala Val Tyr Ala Gln Gln Asp Gly His Cys Leu Phe Cys Lys Lys Pro

225 230 235 240

Ile Asp His Tyr His His Val Val Pro Arg His Lys Gly Gly Ser Glu

245 250 255

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

290 295 300
His Leu Met Glu Tyr Ile Gly Ser Glu Thr Leu Tyr Asp Ala Tyr Ala
305 310 315 320
Thr Asp Gly Arg Ser Thr Lys Gly Phe Arg Ile Ala Lys Asn Val Pro
325 330 335
Lys Glu His Tyr Thr Asp Ala Tyr Cys Ile Ala Cys Ser Ile Leu Asp
340 345 350
Ala Asp Thr Lys Val Ser Thr Pro Val Glu Pro Phe Glu Leu Lys Gln

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

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

485 490

<210> 27

<211> 423

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-3 effector

<400> 27

Met Gln Asn Tyr Thr Phe Val Leu Asp Thr Asn Lys Gln Pro Leu Phe
1 5 10 15

Pro Val His Pro Ala Val Ala Arg Lys Met Leu Ser Asn Ala Glu Ala
20 25 30

Ala Val Phe Arg Arg Tyr Pro Phe Thr Ile Ile Leu Lys His Gly Ala
35 40 45

Asp Arg Pro Thr Gln Ser Ile Glu Ile Lys Leu Asp Pro Gly Ser Lys
50 55 60

Thr Thr Gly Ile Ala Leu Leu Lys Gly Glu Arg Leu Ile Phe Ala Ala
65 70 75 80

Glu Leu Ser His Arg Gly Gln Ala Ile Lys Ala Ser Leu Asp Ala Arg
85 90 95

Arg Ala Ile Arg Arg Asn Arg Arg Thr Arg His Thr Arg Tyr Arg Pro
100 105 110

Ala Arg Phe Leu Asn Arg Thr Arg Ser Lys Gly Trp Leu Thr Pro Ser
115 120 125

Leu Lys His Arg Val Cys Thr Thr Leu Thr Trp Val Asn Lys Phe Ile
130 135 140

Arg Phe Ala Pro Val Asn Ser Ile Ala Met Glu Leu Val Arg Phe Asp
145 150 155 160

Leu Gln Gln Leu Glu Asn Pro Glu Ile Ser Gly Val Glu Tyr Gln Gln
165 170 175

Gly Glu Leu Leu Gly Tyr Glu Ile Arg Glu Tyr Leu Leu Asn Lys Trp
180 185 190

Asp Arg Lys Cys Thr Tyr Cys Gly Ala Glu Asn Ile Pro Leu Gln Val
195 200 205

Glu His Ile His Pro Arg Ala Lys Gly Gly Ser Asn Arg Ile Ser Asn
210 215 220

Leu Cys Leu Ala Cys Glu Lys Cys Asn Leu Lys Lys Gly Thr Gln Asp
225 230 235 240

Ile Lys Asp Phe Leu Ser Lys Lys Thr Asp Leu Leu Lys Gln Ile Met
245 250 255

Ala Gln Ala Lys Arg Pro Leu Lys Asp Ala Ser Ala Val Asn Ser Thr
260 265 270

Arg Trp Ala Leu Phe Asn Gln Leu Lys Leu Thr Gly Leu Pro Val Thr
275 280 285

Thr Gly Ser Gly Gly Gln Thr Lys Tyr Asn Arg Thr Arg Leu Glu Leu
290 295 300

Pro Lys Thr His Tyr Phe Asp Ala Ala Cys Val Gly Lys Val Asp Lys
305 310 315 320

Leu Val Val Leu Thr Thr Gln Pro Leu Leu Ile Lys Ala Asn Gly His
325 330 335

Gly Thr Arg Gln Met Cys Arg Thr Asp Lys Phe Gly Phe Pro Ser Arg
340 345 350

His Ala Pro Arg Asn Lys Phe Val Lys Gly Phe Gln Thr Gly Asp Ile
355 360 365

Val Lys Ala Ile Val Thr Ser Gly Lys Lys Ile Gly Glu Tyr Val Gly
370 375 380

Arg Ala Ala Val Arg Ser Ser Gly Ser Phe Asn Ile Ser Ala Lys Glu
385 390 395 400

Leu Val Gln Gly Ile Gly His Lys Tyr Cys Glu Ile Leu His Arg Lys
405 410 415

Asp Gly Tyr Ser Tyr Gln Phe
420

<210> 28

<211> 229

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-4 effector

<400> 28

Ala Lys His His Asp Leu Val His Lys Asp Lys Ala Trp Thr Glu Lys
1 5 10 15

Leu Val Thr Arg Lys Gly Gly Met Asn Lys Lys Tyr His Ala Leu Ser
20 25 30

Val Leu Asn Gln Ile Ile Pro His Leu Met Glu His Ile Gly Ser Glu
35 40 45

Thr Pro Tyr Asp Ser Tyr Ala Thr Asp Gly Lys Ser Thr Lys Gly Phe
50 55 60

Arg Ile Ala Lys Asn Val Pro Lys Glu His Tyr Thr Asp Ala Tyr Cys
65 70 75 80

Ile Ala Cys Ser Ile Leu Asp Thr Asp Ile Glu Val Ser Met Pro Val
85 90 95

Lys Pro Phe Glu Leu Lys Gln Phe Arg Arg His Asp Arg Gln Ala Cys
100 105 110

Ile Arg Gln Met Val Asp Arg Lys Tyr Leu Leu Asp Gly Lys Val Val
115 120 125

Ala Thr Asn Arg His Lys Ser Ile Glu Gln Lys Ser Asp Ser Leu Glu
130 135 140

Glu Phe Arg Glu Ala Tyr Gly Asp Ala Ala Val Ser Gln Leu Thr Val
145 150 155 160

Arg Leu His Ser Pro Gln Tyr Lys Asp Met Ala Arg Ile Met Pro Gly
165 170 175

Ala Val Met Ala Phe Lys Gly Thr Ile Gly Val Met Gln Cys Ser Gly
180 185 190

Gly Arg Asn Asn Gly Lys Val Glu Phe Phe Lys Ser Thr Lys Gly Asn
195 200 205
Lys Thr Thr Pro Lys Lys Cys Val Leu Leu Ala Gln Asn Ala Gly Met
210 215 220

Val Phe Ile Pro Ala
225

<210> 29
<211> 229
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-5 effector
<400> 29
Ala Lys His His Asp Leu Val His Lys Asp Lys Ala Trp Thr Glu Lys
1 5 10 15
Leu Val Thr Arg Lys Gly Gly Met Asn Lys Lys Tyr His Ala Leu Ser
20 25 30

Val Leu Asn Gln Ile Ile Pro His Leu Met Glu Tyr Leu Gly Glu Glu
35 40 45
Thr Ser Tyr Asp Val Tyr Ala Thr Asp Gly Arg Ser Thr Lys Gly Phe
50 55 60
Arg Ile Ala Lys Asn Val Pro Lys Glu His Tyr Thr Asp Ala Tyr Cys
65 70 75 80
Ile Ala Cys Ser Ile Leu Asp Thr Asn Ile Lys Val Ser Ala Pro Val
85 90 95

Glu Pro Phe Glu Leu Lys Gln Phe Arg Arg His Asp Arg Gln Ala Cys
100 105 110
His Gln Gln Arg Val Asp Arg Lys Tyr Tyr Leu Asp Gly Lys Gln Val
115 120 125
Ala Thr Asn Arg His Lys Ala Ile Glu Gln Lys Ser Asn Ser Leu Glu

130 135 140

Glu Phe His Glu Thr Tyr Gly Asp Ala Ala Val Ser Gln Leu Thr Val
145 150 155 160

Lys Pro His Pro Pro Gln Tyr Lys Asp Met Thr Arg Ile Met Pro Gly
165 170 175

Ala Val Met Asn Phe Cys Gly Ala Val Gly Ile Leu Leu Gly Ser Asp
180 185 190

Gly Phe His Asn Gly Lys Pro Asp Tyr Tyr Lys Ser Thr Lys Glu Glu
195 200 205

Lys Val Arg Met Arg Arg Cys Ala Leu Leu Ala Gln Asn Ala Gly Met
210 215 220

Val Phe Ile Pro Ala
225

<210> 30

<211> 371

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-6 effector

<400> 30

Ala Leu Leu Val His Gly Gln Asp Gly Thr Thr Val Ala Leu Ala Ala
1 5 10 15

His Val Glu His Arg Thr Asn Ile Lys Ser Asn Leu Asp Ser Arg Arg
20 25 30

Ala Ile Arg Arg Ser Arg Arg His Arg Lys Thr Arg Tyr Arg Gln Ala
35 40 45

Arg Phe Leu Asn Arg Thr Arg Pro Lys Gly Trp Leu Pro Pro Ser Leu
50 55 60

Val Ser Lys Ala Glu Asn Ile Leu Asn Trp Val Ile Arg Phe Thr Lys
65 70 75 80

Leu Thr Pro Phe Thr Lys Phe Ala Leu Glu Thr Ala Lys Phe Asp Met
85 90 95

Gln Lys Leu Glu Asn Pro Asp Thr Gln Gly Val Gly Tyr Gln Gln Gly
100 105 110
Arg Met Phe Gly Tyr Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu
115 120 125
Asn Tyr Thr Cys Ile Tyr Cys Gly Ile His Ala Ser Lys Ala Lys Met
130 135 140
Glu Ile Glu His Val Ile Pro Arg Ser Arg Gly Gly Thr Asp Ser Leu
145 150 155 160

Asn Asn Leu Val Leu Ser Cys Arg Ala Cys Asn Glu Ala Lys Gly Ser
165 170 175
Gln Asp Val Gln Thr Tyr Leu Lys Gly Asn Pro Ser Val Leu Arg Arg
180 185 190
Val Lys Ala Arg Leu Asn Thr Asn Tyr Arg Asp Ala Ala His Thr Asn
195 200 205
Ser Ile Arg Leu Phe Val Leu Asn Lys Leu Gln Thr Met Ala Asp Ala
210 215 220

Ile Gly Thr Asn Leu Asn Val Gly Phe Gly Tyr Thr Thr Lys Gln Asn
225 230 235 240
Arg Leu Leu Leu Asn Leu Pro Lys Asp His Trp Ile Asp Ala Ala Val
245 250 255
Cys Thr Ser Asp Gly Ser Ala Val Lys Val Asp Pro Ser Leu Lys Pro
260 265 270
Leu Thr Ile Lys Ala Ile Gly Arg Gly Ser Arg Gln Phe Cys Arg Met
275 280 285

Asn Lys Tyr Gly Phe Pro Arg Thr Ser Pro Lys Pro Arg Ser Lys Asn
290 295 300
Phe Phe Gly Phe Lys Thr Gly Asp Met Val Lys Val Val Val Pro Leu
305 310 315 320
Gly Ser Lys Thr Lys Val Pro Val Gly Thr His Thr Gly Arg Val Ala

325 330 335

Val Arg Ser Ser Gly Ser Phe Asp Val Lys Thr Arg Asp Ala Lys Leu

340 345 350

Gly Ile Tyr His Lys Tyr Cys Gln Gln Ile His Leu Met Asp Gly Tyr

355 360 365

Ser Tyr Ala

370

<210> 31

<211> 333

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-7 effector

<400> 31

Ala Ser Leu Asp Ser Arg Arg Ala Ile Arg Arg Ser Arg Arg Ala Arg

1 5 10 15

His Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn Arg Ile Arg Pro Lys

20 25 30

Gly Trp Leu Ala Pro Ser Leu Lys His Arg Val Asp Thr Thr Leu Thr

35 40 45

Trp Val Asn Lys Phe Ile Arg Phe Ala Pro Val Asn Ser Ile Val Met

50 55 60

Glu Leu Val Arg Phe Asp Leu Gln Gln Leu Glu Lys Pro Glu Ile Ser

65 70 75 80

Gly Ile Glu Tyr Gln Gln Gly Glu Leu Leu Gly Tyr Glu Leu Arg Glu

85 90 95

Tyr Leu Leu Asn Lys Trp Glu Arg Lys Cys Thr Tyr Cys Lys Ile Glu

100 105 110

Asn Val Pro Leu Gln Val Glu His Ile His Pro Lys Ala Lys Gly Gly

115 120 125

Ser Asn Arg Ile Ser Asn Leu Cys Leu Ala Cys Glu Lys Cys Asn Leu
130 135 140
Lys Lys Gly Thr Gln Asp Ile Asn Asp Phe Leu Ile Arg Lys Pro Asp

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

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

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

<210> 32

<211> 71

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-8 effector

<400> 32

Ala Trp Ala Glu Lys Leu Val Thr Arg Lys Gly Gly Met Asn Lys Lys
1 5 10 15

Tyr His Ala Leu Ser Val Leu Asn Gln Ile Ile Pro His Leu Ile Glu
20 25 30

His Leu Gly Ser Glu Thr Pro Tyr Asp Val Tyr Ala Thr Asp Gly Arg
35 40 45

Ser Thr Lys Gly Phe Arg Ile Ala Lys His Val Leu Lys Glu His Tyr
50 55 60

Thr Asp Ala Tyr Cys Val Ala
65 70

<210> 33

<211> 150

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-9 effector

<400> 33

Cys Ile Ala Cys Ser Ile Leu Asp Ala Asp Thr Lys Val Ser Ala Pro
1 5 10 15

Ala Glu Pro Phe Lys Leu Lys Gln Phe Arg Arg His Asp Arg Gln Ser
20 25 30

Cys Ile Arg Gln Met Ala Asp Arg Lys Tyr Leu Leu Asp Gly Lys Val
35 40 45

Val Ala Thr Asn Arg His Lys Ala Ile Glu Gln Arg Ser Asp Ser Leu
50 55 60

Glu Glu Phe Arg Glu Ala Tyr Gly Asp Ala Ala Val Ser Gln Leu Thr

65 70 75 80

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

Met Val Phe Ile Pro Ala
145 150

<210> 34
<211> 182
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-10 effector
<400> 34
Asp Phe Leu Phe Gly Lys Pro Glu Leu Val Gln Arg Ile Leu Thr Gln
1 5 10 15
Ala Lys Ala Pro Leu Lys Asp Ala Ala Ala Val Asn Ser Thr Arg Trp
20 25 30

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

85 90 95

Arg Gln Met Cys Arg Thr Asp Lys Phe Gly Phe Pro Thr Arg His Lys
100 105 110
Ser Arg Val Gln Ile His Lys Gly Phe Gln Thr Gly Asp Ile Val Arg
115 120 125
Ala Thr Val Thr Ala Gly Lys Lys Ile Gly Phe Tyr Val Gly Arg Val
130 135 140
Ile Cys Arg Ala Ser Gly Ser Phe Asp Ile Ala Thr Ala Thr Gly Lys
145 150 155 160

Val Ser Ser Ile Ser His Lys Tyr Cys Lys Thr Ile His Lys Lys Asp
165 170 175
Gly Tyr Ala Tyr Ile Phe
180

<210> 35
<211> 202
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-11 effector
<400> 35
Asp Ile Lys Glu Phe Leu Lys His Lys Pro Lys Arg Leu Lys Thr Ile
1 5 10 15

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

65 70 75 80

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

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

<210> 36

<211> 441

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-12 effector

<400> 36

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

35 40 45

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

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

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

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

Asp Ala Tyr Cys Ile Ala Cys Ser Ile Leu Asp Thr Asn Ile Lys Val
290 295 300

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

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

Asn Ala Gly Met Val Phe Ile Pro Ala
435 440

<210> 37
<211> 218
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-13 effector
<400> 37
Glu His Ile Gln Pro Arg Ser Lys Glu Gly Ser Asn Arg Val Ser Asn
1 5 10 15
Leu Thr Leu Ala Cys Thr Lys Cys Asn Gln Lys Lys Gly Asn Lys Asp

20 25 30

Val Lys Asp Phe Leu Lys Gly Lys Pro Asp Arg Leu Lys Lys Ile Gln
35 40 45
Ala Gln Ala Lys Ala Ser Leu Arg Asp Thr Ala Ala Val Asn Ala Thr
50 55 60
Arg Tyr Ala Ile Gly Glu Ala Leu Lys Thr Phe Gly Phe Val Ile Ser
65 70 75 80
Phe Ser Ser Gly Gly Arg Thr Lys Phe Asn Arg Thr Gln Gln Gly Tyr
85 90 95

Pro Lys Glu His Trp Val Asp Ala Ala Cys Val Gly Glu Asn Gly Asn
100 105 110
Pro Val Ala Ile Pro Lys Ala Ile Thr Pro Leu Ile Ile Thr Ala Lys
115 120 125
Gly Arg Gly Ser Arg Gln Lys Cys Arg Met Asn Lys Tyr Gly Phe Pro
130 135 140
Arg Thr Gly Pro Lys Lys His Lys Arg Val Lys Gly Phe Gln Thr Gly
145 150 155 160

Asp Ile Val Lys Ala Ile Val Thr Lys Gly Lys Lys Ile Gly Thr Tyr
165 170 175
Val Gly Arg Val Ala Val Arg Ala Thr Gly Ser Phe Asp Ile Gly Ser
180 185 190
Gly Ile Glu Ala Val Gly Ser Ile Ser Tyr Lys Tyr Cys Gln Leu Leu
195 200 205
Gln Arg Ser Asp Gly Tyr Asp Tyr Leu Lys
210 215

<210> 38

<211> 303

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-14 effector

<400> 38

Glu Asn Ile Leu Asn Trp Val Ile Arg Phe Thr Lys Leu Thr Pro Phe
1 5 10 15

Thr Lys Phe Ala Leu Glu Thr Ala Lys Phe Asp Met Gln Lys Leu Glu
20 25 30

Asn Pro Asp Thr Gln Gly Val Gly Tyr Gln Gln Gly Arg Met Phe Gly
35 40 45

Tyr Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu Asn Tyr Thr Cys
50 55 60

Ile Tyr Cys Gly Ile His Ala Ser Lys Ala Lys Met Glu Ile Glu His
65 70 75 80

Val Ile Pro Arg Ser Arg Gly Gly Thr Asp Ser Leu Asn Asn Leu Val
85 90 95

Leu Ser Cys Arg Ala Cys Asn Glu Ala Lys Gly Ser Gln Asp Val Gln
100 105 110

Thr Tyr Leu Lys Gly Asn Pro Ser Val Leu Arg Arg Val Lys Ala Arg
115 120 125

Leu Asn Thr Asn Tyr Arg Asp Ala Ala His Thr Asn Ser Ile Arg Leu
130 135 140

Phe Val Leu Asn Lys Leu Gln Thr Met Ala Asp Ala Ile Gly Thr Asn
145 150 155 160

Leu Asn Val Gly Phe Gly Tyr Thr Thr Lys Gln Asn Arg Leu Leu Leu
165 170 175

Asn Leu Pro Lys Asp His Trp Ile Asp Ala Ala Val Cys Thr Ser Asp
180 185 190

Gly Ser Ala Val Lys Val Asp Pro Ser Leu Lys Pro Leu Thr Ile Lys
195 200 205

Ala Ile Gly Arg Gly Ser Arg Gln Phe Cys Arg Met Asn Lys Tyr Gly
210 215 220

Phe Pro Arg Thr Ser Pro Lys Pro Arg Ser Lys Asn Phe Phe Gly Phe

225 230 235 240

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

<210> 39
<211> 242
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-15 effector
<400> 39
Glu Val Arg Glu Tyr Leu Leu Thr Lys Trp Asn Arg Lys Cys Ala Tyr
1 5 10 15
Cys Ser Val Glu Asn Val Pro Phe Glu Ile Glu His Ile Gln Pro Lys
20 25 30
Ser Lys Gly Gly Ser Asp Arg Val Ser Asn Leu Thr Ile Ala Cys His

35 40 45
Asp Cys Asn Gln Lys Lys Gly Asn Gln Asp Val Gln Ala Phe Leu Ala
50 55 60
Thr Lys Pro Asp Leu Leu Asn Cys Ile Leu Lys Gln Ala Lys Leu Pro
65 70 75 80
Leu Lys Asp Ala Ala Ala Val Asn Ser Thr Arg Trp Ala Leu Phe Asn
85 90 95
Ala Leu Lys Glu Thr Gly Leu Ser Val Thr Thr Gly Thr Gly Gly Gln

100 105 110

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

115 120 125

Asp Ala Ala Cys Val Gly Asn Val Glu Thr Leu Glu Ile Leu Thr Ser

130 135 140

Lys Pro Leu Leu Ile Ala Ala Lys Gly His Gly Thr Arg Gln Met Cys

145 150 155 160

Gly Thr Asn Lys Tyr Gly Phe Pro Ile Arg His Lys Ser Arg Val His

165 170 175

Ile His Lys Gly Phe Gln Thr Gly Asp Ile Val Asn Ala Thr Val Thr

180 185 190

Ala Gly Lys Lys Val Gly Ser Tyr Val Gly Arg Val Leu Cys Arg Ala

195 200 205

Ser Gly Ser Phe Asp Ile Val Thr Lys Thr Gly Arg Val Ala Gly Ile

210 215 220

Ser His Lys Tyr Cys Lys Ala Ile His Lys Lys Asp Gly Tyr Ser Tyr

225 230 235 240

Gly Phe

<210> 40

<211> 257

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-16 effector

<400> 40

Phe Gly Tyr Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu Asn Tyr

1 5 10 15

Thr Cys Ile Tyr Cys Gly Ile His Ala Ser Lys Ala Lys Met Glu Ile

20 25 30

Glu His Val Ile Pro Arg Ser Arg Gly Gly Thr Asp Ser Leu Asn Asn
35 40 45
Leu Val Leu Ser Cys Arg Ala Cys Asn Glu Ala Lys Gly Ser Gln Asp
50 55 60
Val Gln Thr Tyr Leu Lys Gly Asn Pro Ser Val Leu Arg Arg Val Lys
65 70 75 80
Ala Arg Leu Asn Thr Asn Tyr Arg Asp Ala Ala His Thr Asn Ser Ile
85 90 95

Arg Leu Phe Val Leu Asn Lys Leu Gln Thr Met Ala Asp Ala Ile Gly
100 105 110
Thr Asn Leu Asn Val Gly Phe Gly Tyr Thr Thr Lys Gln Asn Arg Leu
115 120 125
Leu Leu Asn Leu Pro Lys Asp His Trp Ile Asp Ala Ala Val Cys Thr
130 135 140
Ser Asp Gly Ser Ala Val Lys Val Asp Pro Ser Leu Lys Pro Leu Thr
145 150 155 160

Ile Lys Ala Ile Gly Arg Gly Ser Arg Gln Phe Cys Arg Met Asn Lys
165 170 175
Tyr Gly Phe Pro Arg Thr Ser Pro Lys Pro Arg Ser Lys Asn Phe Phe
180 185 190
Gly Phe Lys Thr Gly Asp Met Val Lys Val Val Val Pro Leu Gly Ser
195 200 205
Lys Thr Lys Val Pro Val Gly Thr His Thr Gly Arg Val Ala Val Arg
210 215 220

Ser Ser Gly Ser Phe Asp Val Lys Thr Arg Asp Thr Lys Leu Thr Val
225 230 235 240
Ser His Lys Tyr Cys Lys Gln Ile His Leu Met Asp Gly Tyr Ser Tyr
245 250 255
Ala

<210> 41
<211> 135

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-17 effector

<400> 41

Gly Leu Gly Ser Val Glu Asp Ala Val Tyr Ala Gln Gln Asp Gly Arg

1 5 10 15

Cys Leu Phe Cys Lys Lys Pro Ile Asp His Tyr His His Val Val Pro

20 25 30

Arg His Lys Gly Gly Ser Glu Thr Leu Ala Asn Arg Cys Gly Leu Cys

35 40 45

Arg Glu His His Ala Leu Val His Thr Asp Lys Val Trp Ala Asp Lys

50 55 60

Leu Val Thr Arg Lys Glu Gly Val Asn Lys Lys Tyr His Ala Leu Ser

65 70 75 80

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

85 90 95

Thr Arg Tyr Asp Val Tyr Ala Thr Asp Gly Arg Ser Thr Lys Gly Phe

100 105 110

Arg Val Ala Lys Asn Val Pro Lys Asp Leu Thr Thr Glu Lys Arg Pro

115 120 125

Tyr Gly Arg Phe Ser Phe Ala

130 135

<210> 42

<211> 433

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-18 effector

<400> 42

Gly Arg Thr Asn Ile Gly Val Ala Val Val Lys Glu Asp Gly Gln Cys
1 5 10 15

Val Phe Ser Ala His Leu Glu Thr Arg Asn Asn Glu Val Pro Phe Leu
20 25 30

Met Lys Lys Arg Ala Ala Phe Arg Arg Ser His Arg Thr Leu Asp Arg
35 40 45

Arg Arg Lys Arg Gln Arg Arg Ala Lys Val Ala Gly Thr Thr Ile Ala
50 55 60

Glu Gly Ser Val Glu Arg Leu Leu Pro Gly Tyr Glu Lys Pro Val Val
65 70 75 80

Cys Arg Tyr Ile Arg Asn Lys Glu Ala Arg Phe Asn Asn Arg Ser Arg
85 90 95

Pro Ala Gly Trp Leu Thr Pro Thr Val Asn His Leu Leu Arg Thr His
100 105 110

Ile Asn Leu Ile Ala Lys Val Ala Lys Phe Leu Pro Ile Thr Lys Val
115 120 125

Val Val Glu Leu Asn Leu Phe Ala Phe Ile Ala Met Asp Asn Pro Asn
130 135 140

Ile Arg Arg Trp Glu Tyr Gln Gln Gly Pro Leu Tyr Gly Leu Gly Ser
145 150 155 160

Val Glu Asp Ala Val Tyr Ala Gln Gln Asp Gly His Cys Leu Phe Cys
165 170 175

Lys Lys Pro Ile Asp His Tyr His His Val Ile Pro Arg Arg Lys Asn
180 185 190

Gly Ser Glu Thr Leu Ala Asn Arg Cys Gly Leu Cys Ala Lys His His
195 200 205

Asp Leu Val His Lys Asp Lys Ala Trp Ala Glu Lys Leu Val Thr Arg
210 215 220

Lys Gly Gly Met Asn Lys Lys Tyr His Ala Leu Ser Val Leu Asn Gln

225 230 235 240

Ile Ile Pro His Leu Leu Glu Tyr Leu Gly Asp Glu Thr Leu Tyr Asp

245 250 255

Ile Tyr Ala Thr Asn Gly Arg Ser Thr Lys Gly Phe Arg Ile Ala Lys

260 265 270

Asn Val Pro Lys Glu His Tyr Thr Asp Ala Tyr Cys Ile Ala Cys Ser

275 280 285

Ile Leu Asp Thr Asp Ile Lys Val Ser Ala Pro Val Glu Pro Phe Glu

290 295 300

Leu Lys Gln Phe Arg Arg His Asp Arg Gln Ala Cys Ile Arg Gln Met

305 310 315 320

Val Asp Arg Lys Tyr Leu Leu Asp Gly Lys Val Val Ala Thr Asn Arg

325 330 335

His Lys Ala Ile Glu Gln Lys Ser Asp Ser Leu Ala Glu Phe Arg Glu

340 345 350

Ala Tyr Gly Glu Ala Ala Val Ser Gln Leu Thr Val Lys Pro His Pro

355 360 365

Pro Gln Tyr Lys Asp Met Ala Arg Ile Met Pro Gly Ala Val Met Asp

370 375 380

Phe Gly Gly Ala Val Gly Ile Leu Gln Gly Ser Glu Gly Phe His Asn

385 390 395 400

Gly Lys Pro Asp Tyr Tyr Arg Ser Thr Lys Gly Glu Lys Val Arg Pro

405 410 415

Arg Arg Cys Glu Leu Ile Ala Gln Asn Ala Gly Met Val Phe Ile Pro

420 425 430

Ala

<210> 43

<211> 124

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-19 effector

<400> 43

Gly Tyr Ser Lys Asp His Trp Ile Asp Ala Ala Cys Val Gly Glu Ser
1 5 10 15

Gly Ser His Val Val Ile Pro Lys Thr Ile Thr Pro Leu Ile Ile Thr
20 25 30

Ala Lys Gly Arg Gly Ser Arg Gln Lys Cys Arg Met Asn Gln Tyr Gly
35 40 45

Phe Pro Arg Thr Gly Pro Lys Lys Gln Lys Arg Val Lys Gly Phe Gln
50 55 60

Thr Gly Asp Ile Val Lys Ala Val Val Thr Lys Gly Lys Lys Ile Gly
65 70 75 80

Thr Tyr Ile Gly Arg Val Val Val Arg Ala Lys Gly Ser Phe Asp Ile
85 90 95

Gly Ser Gly Glu Glu Lys Val Gly Gly Ile Ser Tyr Lys Tyr Cys Gln
100 105 110

Leu Leu Gln Arg Ser Asp Gly Tyr Glu Tyr Leu Lys
115 120

<210> 44

<211> 137

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-20 effector

<400> 44

His Asp Cys Asn Gln Lys Lys Gly Asn Gln Asp Val Arg Glu Phe Leu
1 5 10 15

Ala Thr Lys Pro Asp Leu Leu Asn Arg Ile Leu Gln Gln Ala Lys Leu

20 25 30

Pro Leu Lys Asp Ala Ala Ala Val Asn Ser Thr Arg Trp Ala Leu Phe

35 40 45

Arg Ala Leu Lys Glu Thr Gly Leu Pro Val Thr Asp Gly Thr Gly Gly

50 55 60

Gln Thr Lys Phe Asn Arg Asn Arg Leu Gly Leu Pro Lys Ser His Trp

65 70 75 80

Leu Asp Ala Ala Cys Val Gly Asn Val Glu Thr Leu Lys Val Leu Thr

85 90 95

Ser Lys Pro Leu Leu Ile Ala Ala Thr Gly His Gly Arg Arg Gln Met

100 105 110

Cys Gly Thr Asn Lys Tyr Gly Phe Pro Thr Arg His Lys Ser Arg Val

115 120 125

Gln Ile His Lys Gly Phe Leu Ala Trp

130 135

<210> 45

<211> 41

<212> PRT

<213

> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-21 effector

<400> 45

Ile Gly Arg Val Val Val Arg Ala Arg Gly Ser Phe Asp Ile Gly Ile

1 5 10 15

Gly Lys Lys Lys Val Ser Gly Ile Ser Tyr Lys Tyr Cys Gln Leu Ile

20 25 30

Gln Arg Val Asp Gly Tyr Glu Tyr Ile

35 40

<210> 46

<211> 309

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-22 effector

<400> 46

Ile Thr Lys Val Val Val Glu Leu Asn Arg Phe Ala Phe Met Ala Met
1 5 10 15

Asp Asn Pro Asn Ile Arg Arg Trp Glu Tyr Gln Gln Gly Pro Leu Cys
20 25 30

Gly Leu Gly Ser Val Glu Asp Ala Val Tyr Ala Gln Gln Asp Gly His
35 40 45

Cys Leu Phe Cys Lys Lys Pro Ile Asp His Tyr His His Val Val Pro
50 55 60

Arg His Lys Gly Gly Ser Glu Thr Leu Val Asn Arg Cys Gly Leu Cys
65 70 75 80

Thr Glu His His Ser Leu Val His Thr Asp Lys Val Trp Ala Asp Lys
85 90 95

Leu Val Thr Arg Lys Glu Gly Met Asn Lys Lys Tyr His Ala Leu Ser
100 105 110

Val Leu Asn Gln Ile Ile Pro His Leu Met Glu Tyr Leu Gly Asn Glu
115 120 125

Thr Leu Tyr Asp Val Tyr Ala Thr Asp Gly Arg Ser Thr Lys Gly Phe
130 135 140

Arg Ile Ala Lys Asn Val Pro Lys Glu His Tyr Thr Asp Ala Tyr Cys
145 150 155 160

Ile Ala Cys Ser Ile Leu Asp Thr Asp Ile Glu Val Ser Ala Pro Val
165 170 175

Glu Pro Phe Glu Leu Lys Gln Phe Arg Arg His Asp Arg Gln Ala Cys
180 185 190

Ile Arg Gln Met Ala Asp Arg Lys Tyr Leu Leu Asp Gly Lys Val Val

195 200 205

Ala Ala Asn Arg His Lys Ala Ile Glu Gln Lys Ser Asp Cys Leu Ala

210 215 220

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

225 230 235 240

Lys Pro His Pro Pro Gln Tyr Lys Asp Met Ala Arg Ile Met Pro Gly

245 250 255

Ala Val Met Asp Phe Asn Gly Thr Ile Gly Val Met Gln Cys Ser Ser

260 265 270

Gly Arg Asn Asn Gly Gly Val Asp Tyr Phe Lys Ser Thr Lys Gly His

275 280 285

Lys Ala Thr Pro Lys Arg Cys Val Leu Leu Thr Gln Ile Ala Gly Met

290 295 300

Val Phe Ile Pro Thr

305

<210> 47

<211> 47

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-23 effector

<400> 47

Lys Lys Ile Gly Thr His Ile Gly Arg Val Val Val Arg Ala Arg Gly

1 5 10 15

Ser Phe Asp Ile Gly Ile Gly Lys Lys Lys Val Ser Gly Ile Ser Tyr

20 25 30

Lys Tyr Cys Gln Leu Ile Gln Arg Val Asp Gly Tyr Glu Tyr Thr

35 40 45

<210> 48

<211> 209

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-24 effector

<400> 48

Lys Leu Val Thr Arg Lys Glu Gly Met Asn Lys Lys Tyr His Ala Leu
1 5 10 15

Ser Val Leu Asn Gln Ile Ile Pro Phe Leu Met Glu Tyr Leu Gly Ser
20 25 30

Glu Thr Leu Tyr Asp Val Tyr Ala Ile Asp Gly Arg Ser Ile Lys Gly
35 40 45

Phe Arg Ile Ala Lys Asn Val Pro Lys Glu His Tyr Thr Asp Ala Tyr
50 55 60

Cys Ile Ala Cys Ser Ile Leu Asp Thr Asp Asn Lys Val Ser Ala Pro
65 70 75 80

Val Glu Pro Phe Glu Leu Lys Gln Phe Arg Arg His Asp Arg Gln Ala
85 90 95

Cys Ile Arg Gln Met Val Asp Arg Lys Tyr Leu Leu His Gly Lys Val
100 105 110

Val Ala Ala Asn Arg His Lys Ala Phe Glu Gln Lys Ser Asp Ser Leu
115 120 125

Gln Glu Phe Arg Glu Ala Tyr Ser Asp Val Ala Val Ser Gln Leu Thr
130 135 140

Val Lys Pro His Pro Pro Gln Tyr Lys Asp Met Ser Arg Ile Met Pro
145 150 155 160

Gly Ala Val Met Asp Phe Asp Gly Ile Val Gly Val Met Gln Ser Ser
165 170 175

Ile Val Gly Gln Phe Tyr Lys Ser Thr Lys Gly His Lys Ala Thr Pro
180 185 190

Lys Arg Cys Val Leu Leu Ser Gln Asn Ala Gly Met Val Phe Ile Pro

195 200 205

Thr

<210> 49
<211> 214
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-25 effector
<400> 49

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

35 40 45
Phe Arg Val Ala Lys Asn Val Pro Lys Glu His Tyr Thr Asp Ala Tyr
50 55 60
Cys Ile Ala Cys Ser Ile Leu Asp Ala Asp Thr Thr Val Ser Thr Pro
65 70 75 80
Val Glu Pro Phe Arg Leu Lys Gln Phe Arg Arg His Asp Arg Gln Ser
85 90 95
Cys Ile Arg Gln Met Val Asp Arg Lys Tyr Leu Leu Asp Gly Lys Val

100 105 110
Val Ala Thr Asn Arg His Lys Ala Ile Glu Gln Lys Ser Asp Ser Leu
115 120 125
Glu Glu Phe Arg Glu Ala Tyr Gly Asp Ala Ala Val Ser Gln Leu Ile
130 135 140
Val Lys Pro His Gln Pro Gln His Lys Asp Met Thr Arg Ile Met Pro
145 150 155 160

Gly Ala Val Met Asp Phe Cys Gly Thr Ala Gly Ile Leu Gln Gly Ser

165 170 175

Glu Gly Phe His Asn Gly Lys Pro Asp Tyr Tyr Lys Ser Thr Lys Gly

180 185 190

Ala Lys Gly Leu Thr Lys Arg Cys Val Leu Leu Ala Arg Asn Ala Gly

195 200 205

Met Val Phe Ile Pro Ala

210

<210> 50

<211> 87

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223>

Category: MG35 effectors

<220><223> Description: MG35-26 effector

<400> 50

Leu Ala Cys Thr Pro Cys Asn Ile Asp Pro Gly Asn Arg Asp Ile Lys

1 5 10 15

Glu Phe Leu Lys Arg Lys Pro Lys Arg Leu Lys Lys Ile Gln Thr Gln

20 25 30

Ser Lys Ala Pro Leu Lys Asp Ala Ala Ala Val Asn Ala Thr Arg Tyr

35 40 45

Ala Thr Gly Asn Ala Leu Lys Ser Phe Gly Leu Pro Ile Ala Phe Ser

50 55 60

Ser Gly Gly Arg Thr Lys Phe Asn Arg Ile Lys Leu Gly Tyr Ser Lys

65 70 75 80

Asp His Trp Ile Asp Ala Ala

85

<210> 51

<211> 88

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-27 effector

<400> 51

Leu Ala Cys Thr Pro Cys Asn Ile Asp Pro Gly Asn Arg Asp Ile Lys

1 5 10 15

Glu Phe Leu Lys Arg Lys Pro Lys Arg Leu Lys Lys Ile Gln Thr Gln

20 25 30

Ser Lys Ala Pro Leu Lys Asp Ala Ala Ala Val Asn Ala Thr Arg Tyr

35 40 45

Ala Thr Gly Asn Ala Leu Lys Ser Phe Gly Leu Pro Ile Ala Phe Ser

50 55 60

Ser Gly Gly Arg Thr Lys Phe Asn Arg Ile Lys Leu Gly Tyr Ser Lys

65 70 75 80

Asp His Trp Ile Asp Ala Ala Trp

85

<210> 52

<211> 423

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-28 effector

<400> 52

Leu Ala His Asn Lys Gln Pro Leu Met Pro Cys His Pro Ala Arg Ala

1 5 10 15

Arg Lys Leu Leu Lys Lys Gly Lys Ala Ala Val Tyr Arg Arg Tyr Pro

20 25 30

Phe Thr Ile Ile Met Thr His Arg Leu Cys Gly Asp Leu Gln Pro Ile

35 40 45

Glu Ile Lys Phe Asp Pro Gly Ser Arg Thr Thr Gly Ile Ala Leu Val

50 55 60

Gly His Phe Asp Arg Gly Ser Glu Val Ile Trp Ala Gly Asn Leu Asn

65 70 75 80

His Arg Gly Leu Gln Val Lys Ser Asn Leu Val Ser Arg Arg Ala Ile

85 90 95

Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg Pro Ala Arg Phe

100 105 110

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

115 120 125

Arg Val Leu Asn Val Lys Asn Trp Met Leu Lys Leu Ser Arg Leu Ala

130 135 140

Pro Leu Thr Gln Ile Ala Ile Glu Thr Val Arg Phe Asp Thr Gln Lys

145 150 155 160

Met Gln Lys Pro Glu Ile Ser Gly Ile Glu Tyr Gln Gln Gly Glu Leu

165 170 175

Val Gly Tyr Glu Leu Arg Glu Tyr Leu Leu Glu Lys Trp Asp Arg Gln

180 185 190

Cys Ala Tyr Cys Gly Ala Lys Asn Val Pro Leu Glu Ile Glu His Ile

195 200 205

Gln Ala Ser Ser Lys Gly Gly Ser Asn Arg Val Ser Asn Leu Thr Leu

210 215 220

Ala Cys Ser Pro Cys Asn Phe Asp Lys Gly Asn Lys Asp Ile Lys Glu

225 230 235 240

Phe Leu Lys Arg Lys Pro Lys Arg Leu Lys Lys Ile Gln Ala Gln Ala

245 250 255

Lys Ala Ser Leu Lys Asp Ala Ala Ala Val Asn Ala Thr Arg Tyr Ala

260 265 270

Thr Gly Asn Ile Leu Lys Cys Phe Gly Leu Pro Ile Thr Phe Ser Ser

275 280 285

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

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

405 410 415
Asp Gly Tyr Glu Tyr Leu Lys
420

<210> 53
<211> 441
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-29 effector
<400> 53
Leu Ala Arg Arg Ala Leu Pro Thr Gln Val Glu Leu Gly Asn Glu Pro
1 5 10 15
Cys Lys Glu Lys Lys Pro Leu Met Pro Cys His Pro Ala Arg Ala Arg

20 25 30
Lys Leu Leu Lys Asn Gly Lys Ala Ala Val Asp Arg Thr Tyr Pro Phe

35 40 45

Thr Ile Ile Leu Lys Tyr Cys Val Lys Glu Gly Leu Gln Pro Ile Glu

50 55 60

Val Lys Phe Asp Pro Gly Ser Arg Thr Thr Gly Leu Ala Leu Val Gly

65 70 75 80

Asn Phe Glu Arg Gly Lys Glu Val Ile Phe Ala Gly Asn Leu Ile His

85 90 95

Arg Gly Gly Gln Ile Lys Ser Asn Leu Asn Ser Arg Arg Ala Ile Arg

100 105 110

Arg Gly Arg Arg Asn Arg Lys Thr Arg Tyr Arg Pro Ala Arg Phe Asn

115 120 125

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

130 135 140

Val Leu Asn Val Glu Asn Trp Met Leu Lys Leu Ala Arg Leu Ala Pro

145 150 155 160

Leu Thr Gln Ile Ala Val Glu Thr Val Arg Phe Asp Thr Gln Lys Leu

165 170 175

Gln Lys Pro Glu Ile Ser Gly Val Glu Tyr Gln Gln Gly Glu Leu Ala

180 185 190

Gly Tyr Glu Leu Arg Glu Tyr Leu Leu Glu Lys Trp Glu Arg Gln Cys

195 200 205

Ala Tyr Cys Gly Ala Lys Asn Val Pro Leu Glu Val Glu His Ile Gln

210 215 220

Ala Arg Ser Lys Gly Gly Thr Asn Arg Val Ser Asn Leu Thr Leu Ala

225 230 235 240

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

245 250 255

Leu Lys Arg Lys Pro Ser Arg Leu Lys Lys Val Leu Ala Gln Ala Lys

260 265 270

Lys Pro Leu Arg Asp Ala Ala Ala Val Asn Ala Thr Arg Tyr Ala Ile

275 280 285

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

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

405 410 415
Val Ser Gly Ile Ser His Lys Tyr Cys Gln Leu Phe Gln Arg Ile Asp
420 425 430
Gly Tyr Glu Tyr Ser Leu Thr Ser Asn
435 440

<210> 54
<211> 104
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-30 effector
<400> 54
Leu Glu Val Leu Thr Gly Lys Pro Leu Leu Ile Lys Ala Thr Gly His

1 5 10 15
Gly Ser Arg Gln Met Cys Gly Thr Asp Lys Phe Gly Phe Pro Ser Arg

20 25 30

His Arg Thr Arg Lys Gln Ile His Gln Gly Phe Gln Thr Gly Asp Ile

35 40 45

Val Lys Ala Leu Val Thr Ser Gly Lys Lys Ile Gly Ser Tyr Val Gly

50 55 60

Arg Val Leu Cys Arg Ala Ser Gly Ser Phe Asp Ile Gln Val Lys Ser

65 70 75 80

Gly Arg Val Gln Gly Leu Ser His Lys Phe Cys Arg Ser Val His Arg

85 90 95

Lys Asp Gly Tyr Gly Tyr Gly Phe

100

<210> 55

<211> 149

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-31 effector

<400> 55

Leu Phe Asn Ala Leu Arg Ala Thr Gly Leu Pro Val Thr Thr Gly Thr

1 5 10 15

Gly Gly Gln Thr Lys Phe Asn Arg Thr Arg Leu Gly Leu Pro Lys Ala

20 25 30

His Trp Leu Asp Ala Ala Cys Val Gly Gln Val Gly Ala Leu Glu Val

35 40 45

Leu Thr Ser Lys Pro Leu Leu Ile Thr Ala Lys Gly Asn Gly Thr Arg

50 55 60

Gln Met Cys Gly Thr Asn Lys Phe Gly Phe Pro Thr Arg His Arg Ser

65 70 75 80

Arg Val Gln Ile His Arg Gly Phe Gln Thr Gly Asp Ile Val Arg Ala

85 90 95

Thr Val Thr Ala Gly Lys Lys Val Gly Val Tyr Val Gly Arg Val Leu

100 105 110

Cys Arg Ala Ser Gly Ser Phe Asp Ile Val Thr Ala Thr Gly Arg Val

115 120 125

Ser Ser Ile Asn His Lys Tyr Cys Lys Thr Ile His Lys Lys Asp Gly

130 135 140

Tyr Ala Tyr Val Val

145

<210> 56

<211> 509

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-32 effector

<400> 56

Leu Lys Leu Arg Ser Glu Gly His Asp Thr His Gly Cys Val Pro Val

1 5 10 15

Arg Gly Ser Ile Val Arg Val His Ala Ala Leu Val Gly Asp Gly Ala

20 25 30

Lys Asp Ala Gly Ala Thr Ser Pro Arg Asp Met Ser Glu Ala Asn Val

35 40 45

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

50 55 60

Gly Ala Val Val Pro Arg Arg His Ser Gly His Val Phe Val Leu Gly

65 70 75 80

Ala Asp Arg Gln Pro Leu Asn Pro Cys Ser Ser Ala Tyr Ala Arg Arg

85 90 95

Leu Leu Arg Asn Gly Lys Ala Ala Val Phe Arg Arg Phe Pro Phe Thr

100 105 110

Ile Ile Leu Lys Glu Arg Thr Arg Asp Leu Ser Lys Val Ser Asp His

115 120 125

Arg Leu Lys Leu Asp Pro Gly Ser Lys Thr Thr Gly Ile Ala Val Leu

130 135 140

Ser Gly Lys Asn Val Val Phe Ala Ala Glu Leu Lys His Arg Gly Gln

145 150 155 160

Glu Ile Thr Thr Arg Leu Met Glu Arg Arg Gln Phe Arg Arg Cys Arg

165 170 175

Arg Asn Arg Thr Thr Arg Tyr Arg Lys Pro Arg Phe Asn Asn Arg Arg

180 185 190

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

195 200 205

Leu Met Thr Trp Val Arg Arg Leu Arg Lys Val Cys Pro Ile Ser Ser

210 215 220

Ile Ser Val Glu Leu Ala Lys Phe Asp Thr Gln Leu Met Glu Asn Pro

225 230 235 240

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

245 250 255

Val Arg Glu Tyr Leu Leu Glu Lys Trp Gly Arg Arg Cys Ala Tyr Cys

260 265 270

Gly Thr Glu Asn Ala Gln Leu Glu Val Glu His Ile Val Pro Lys Ser

275 280 285

Arg Gly Gly Ser Asn Arg Val Asp Asn Leu Thr Leu Ala Cys His Pro

290 295 300

Cys Asn Glu Lys Lys Gly Ala Arg Thr Ala Ala Glu Phe Gly Tyr Pro

305 310 315 320

Glu Ile Gln Lys Lys Ala Lys Gln Pro Ile Lys Asp Ala Ala Ala Met

325 330 335

Asn Ala Thr Arg Trp Ile Ile Phe Glu Arg Leu Lys Glu Thr Gly Leu

340 345 350

Pro Val Glu Cys Gly Thr Gly Ser Arg Thr Lys Phe Asn Arg Lys Arg

355 360 365

Leu Gly Leu Pro Lys Thr His Trp Gly Asp Ala Val Cys Val Gly Val
370 375 380
Ser Val Pro Asn Arg Ile Ile Gly Pro Ser Ser Val Leu Asn Ile Thr
385 390 395 400
Ala Thr Gly His Gly Asn Arg Gln Met Cys Gly Thr Asp Arg Cys Gly

405 410 415
Phe Pro Ile Arg His Arg Thr Arg Leu Lys Arg His Phe Gly Phe Gln
420 425 430
Thr Gly Asp Met Val Arg Ala Thr Val Pro Ser Gly Lys Arg Ala Gly
435 440 445
Thr His Val Gly Arg Val Leu Cys Arg Ser Thr Gly Asn Phe Asp Ile
450 455 460
Gln Thr Arg Met Gly Arg Val Thr Gly Ile Ser His Arg Tyr Cys Arg

465 470 475 480
Thr Ile His Arg Gln Asp Gly Tyr Arg Tyr Ser Ile Glu Gly Gly Gly
485 490 495
Ala Ser Ser Pro Arg Leu Lys Pro Gly Ala Ser Ala Pro
500 505

<210> 57
<211> 469
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-33 effector
<400> 57

Leu Leu Lys Glu Lys Lys Ala Arg Val Val Cys Thr Thr Pro Phe Thr
1 5 10 15
Ile Gln Leu Asn Tyr Asp Thr Pro Asp Ile Thr Gln Asp Leu Ile Leu
20 25 30
Gly Ile Asp Pro Gly Arg Thr Asn Ile Gly Val Ala Val Val Lys Glu

35 40 45

Asp Gly Gln Cys Val Phe Ser Ala His Leu Glu Thr Arg Asn Lys Asp

50 55 60

Val Pro Leu Leu Met Lys Lys Arg Ala Gly Phe Arg Lys Gln His Arg

65 70 75 80

Thr Leu Asp Arg Arg Arg Lys Arg Gln Arg Arg Ala Lys Ala Thr Gly

85 90 95

Asn Thr Val Lys Asn Glu Thr Ile Glu Arg Leu Leu Pro Cys Tyr Gln

100 105 110

Arg Pro Ile Val Cys His Tyr Ile Arg Asn Lys Glu Ala Arg Phe Asn

115 120 125

Asn Arg Ser Arg Pro Ala Gly Trp Leu Thr Pro Thr Ala Asn His Leu

130 135 140

Leu Gln Thr His Ile Asn Leu Ile Ala Lys Val Gly Lys Phe Leu Pro

145 150 155 160

Ile Thr Lys Val Val Val Glu Leu Asn Arg Phe Ala Phe Met Ala Met

165 170 175

Asp Asn Pro Asn Ile Arg Arg Trp Glu Tyr Gln Gln Gly Pro Leu Tyr

180 185 190

Gly Leu Gly Ser Val Glu Asp Ala Val Tyr Ala Gln Gln Asp Gly His

195 200 205

Cys Leu Phe Cys Asp Lys Pro Ile Asp His Tyr His His Val Val Pro

210 215 220

Arg His Lys Gly Gly Ser Glu Thr Leu Ala Asn Arg Cys Gly Leu Cys

225 230 235 240

Ala Glu His His Asp Leu Val His Lys Asp Lys Ala Trp Ala Glu Lys

245 250 255

Leu Val Thr Arg Lys Gly Gly Met Asn Lys Lys Tyr His Ala Gln Ser

260 265 270

Val Leu Asn Gln Ile Ile Ser Phe Leu Met Glu Tyr Leu Gly Arg Glu

275 280 285

Thr Pro Tyr Asp Val Tyr Ala Thr Asp Gly Lys Ser Thr Lys Gly Phe
290 295 300
Arg Ile Ala Lys Asn Val Pro Lys Glu His Tyr Thr Asp Ala Tyr Cys
305 310 315 320

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

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

Lys Thr Pro Pro Lys Lys Cys Val Leu Leu Ala Gln Asn Ala Gly Met
450 455 460
Val Phe Ile Pro Ala
465
<210> 58
<211> 130
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-34 effector

<400> 58

Leu Leu Leu Asn Leu Pro Lys Asp His Trp Ile Asp Ala Ala Val Cys
1 5 10 15

Thr Ser Asp Gly Ser Ala Val Lys Val Asp Pro Ser Leu Lys Pro Leu
20 25 30

Thr Ile Lys Ala Ile Gly Arg Gly Ser Arg Gln Phe Cys Arg Met Asn
35 40 45

Lys Tyr Gly Phe Pro Arg Thr Ser Pro Lys Pro Arg Ser Lys Asn Phe
50 55 60

Phe Gly Phe Lys Thr Gly Asp Met Val Lys Val Val Val Pro Leu Gly
65 70 75 80

Ser Lys Thr Lys Val Pro Val Gly Thr His Thr Gly Arg Val Ala Val
85 90 95

Arg Ser Ser Gly Ser Phe Asp Val Lys Thr Arg Asp Ala Lys Leu Gly
100 105 110

Ile Tyr His Lys Tyr Cys Gln Gln Ile His Leu Met Asp Gly Tyr Ser
115 120 125

Tyr Ala
130

<210> 59

<211> 416

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-35 effector

<400> 59

Leu Leu Ser Gly Gly Arg Ala Ser Val Phe Arg Arg Leu Pro Phe Thr
1 5 10 15

Ile Ile Leu His Asp Arg Thr Val Glu Glu Ser Glu Leu Gln Asp Met
20 25 30

Glu Ile Lys Ile Asp Gln Gly Ser Lys Thr Thr Gly Val Val Met Leu

35 40 45

Val His Gly Gln Asp Gly Thr Thr Val Ala Leu Ala Ala His Val Glu

50 55 60

His Arg Thr Asn Ile Lys Ser Asn Leu Asp Ser Arg Arg Ala Ile Arg

65 70 75 80

Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Leu

85 90 95

Asn Arg Thr Arg Pro Lys Gly Trp Leu Pro Pro Ser Leu Val Cys Lys

100 105 110

Ala Glu Asn Ile Leu Asn Trp Val Ile Arg Phe Thr Lys Leu Thr Pro

115 120 125

Phe Thr Lys Phe Ala Leu Glu Thr Ala Lys Phe Asp Met Gln Lys Leu

130 135 140

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

145 150 155 160

Gly Tyr Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu Gln Arg Cys

165 170 175

Cys Ile Tyr Cys Gly Ile His Ala Ser Lys Ala Lys Met Glu Ile Glu

180 185 190

His Val Ile Pro Arg Ser Arg Gly Gly Thr Asp Ser Leu Asn Asn Leu

195 200 205

Val Leu Ser Cys His Ala Cys Asn Gln Ala Lys Gly Asn Leu Ser Leu

210 215 220

Ser Glu Tyr Leu Lys Gly Lys Pro Ser Val Leu Lys Arg Val Lys Ala

225 230 235 240

His Leu Gly Ile Asn Tyr Arg Asp Ala Ala His Thr Asn Ser Ile Arg

245 250 255

Leu Tyr Val Met Asn Lys Leu Arg Ala Met Ala Glu Ala Ile Gly Ala

260 265 270

Lys Leu Val Val Gly Phe Gly Ser Thr Thr Lys Gln Asn Arg Leu Leu

275 280 285

Leu Gly Leu Pro Lys Asp His Trp Ile Asp Ala Ala Val Cys Thr Lys

290 295 300

Asp Gly Ala Ser Val Arg Val Glu Pro Ala Leu Lys Pro Leu Val Ile

305 310 315 320

Lys Ala Val Gly Arg Gly Ser Arg Gln Phe Cys Arg Met Asp Lys His

325 330 335

Gly Phe Pro Arg Thr Ser Pro Lys Pro Arg Ser Lys Asn Phe Phe Gly

340 345 350

Phe Lys Thr Gly Asp Met Val Lys Val Ile Val Pro Thr Gly Ala Lys

355 360 365

Thr Lys Val Pro Thr Gly Thr Tyr Thr Gly Arg Val Ala Val Arg Ser

370 375 380

Lys Gly Ser Phe Asp Val Lys Thr Arg Asp Thr Lys Leu Thr Val Ser

385 390 395 400

His Lys Tyr Cys Lys Gln Ile His Leu Met Asp Gly Tyr Ser Tyr Ala

405 410 415

<210> 60

<211> 436

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-36 effector

<400> 60

Leu Val Leu Asp Thr Asn Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala

1 5 10 15

Arg Ala Lys Lys Leu Leu Asn Ser Gly Arg Ala Ser Val Phe Arg Arg

20 25 30

Phe Pro Phe Thr Ile Ile Leu His Asp Arg Thr Val Glu Glu Ser Glu

35 40 45

Leu Gln Asp Thr Glu Ile Lys Ile Asp Gln Gly Ser Lys Thr Thr Gly
50 55 60

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

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

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

Arg Val Lys Ala Arg Leu Asn Thr Asn Tyr Arg Asp Ala Ala His Thr
260 265 270
Asn Ser Ile Arg Leu Phe Val Leu Asn Lys Leu Gln Thr Met Ala Asp
275 280 285
Ala Ile Gly Thr Asn Leu Asn Val Gly Phe Gly Tyr Thr Thr Lys Gln

290 295 300

Asn Arg Leu Leu Leu Asn Leu Pro Lys Asp His Trp Ile Asp Ala Ala
305 310 315 320

Val Cys Thr Ser Asp Gly Ser Ala Val Lys Val Asp Pro Ser Leu Lys
325 330 335

Pro Leu Thr Ile Lys Ala Ile Gly Arg Gly Ser Arg Gln Phe Cys Arg
340 345 350

Met Asn Lys Tyr Gly Phe Pro Arg Thr Ser Pro Lys Pro Arg Ser Lys
355 360 365

Asn Phe Phe Gly Phe Lys Thr Gly Asp Met Val Lys Val Val Val Pro
370 375 380

Leu Gly Ser Lys Thr Lys Val Pro Val Gly Thr His Thr Gly Arg Val
385 390 395 400

Ala Val Arg Ser Ser Gly Ser Phe Asp Val Lys Thr Arg Asp Ala Lys
405 410 415

Leu Gly Ile Tyr His Lys Tyr Cys Gln Gln Ile His Leu Met Asp Gly
420 425 430

Tyr Ser Tyr Ala
435

<210> 61
<211> 89
<212> PRT
<213> Unknown
<220><223> Description of Unknown:

uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-37 effector
<400> 61

Met Ala Met Val Tyr Val Gln Asn Lys Asp Gly Lys Pro Leu Met Pro
1 5 10 15

Thr Thr Arg Tyr Cys Tyr Val Arg Leu Leu Leu Lys Glu Lys Lys Ala
20 25 30

Arg Val Val Cys Thr Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr
35 40 45

Pro Asp Ile Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr
50 55 60
Asn Ile Gly Phe Ala Val Val Lys Glu Asp Gly Gln Cys Val Phe Ser
65 70 75 80
Ala His Leu Glu Thr Arg Asn Lys Asp
85

<210> 62
<211> 494
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-38 effector

<400> 62
Met Ala Met Val Tyr Val Gln Asn Lys Asp Gly Lys Pro Leu Met Pro
1 5 10 15
Thr Thr Arg Tyr Cys Tyr Val Arg Leu Leu Leu Lys Glu Lys Lys Ala
20 25 30
Arg Val Val Cys Thr Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr
35 40 45
Pro Asp Ile Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr
50 55 60

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

115 120 125

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

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

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

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

Phe Arg Arg His Asp Arg Gln Ala Cys Ile Arg Gln Met Val Asp Arg
370 375 380

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

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

<210> 63
<211> 353
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors

<220><223> Description: MG35-39 effector
<400> 63
Met Ala Met Val Tyr Val Gln Asn Lys Asp Gly Lys Pro Leu Met Pro
1 5 10 15
Thr Thr Arg Tyr Cys Tyr Val Arg Leu Leu Leu Lys Glu Lys Lys Ala
20 25 30
Arg Val Val Cys Thr Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr
35 40 45

Pro Asp Ile Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr

50 55 60

Asn Ile Gly Phe Ala Val Val Lys Glu Asp Gly Gln Cys Val Phe Ser

65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Asp Val Pro Leu Leu Met Lys Lys

85 90 95

Arg Ala Ala Phe Arg Arg Ser His Arg Thr Leu Asp Arg Arg Arg Lys

100 105 110

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

115 120 125

Ile Glu Arg Leu Leu Pro Cys Tyr Lys Lys Pro Val Val Cys His Tyr

130 135 140

Ile Arg Asn Lys Glu Ala Arg Phe Asn Asn Arg Lys Arg Pro Lys Gly

145 150 155 160

Trp Leu Thr Pro Thr Ala Asn His Leu Leu Gln Thr His Ile Asn Leu

165 170 175

Ile Ala Lys Val Ala Lys Phe Leu Pro Ile Thr Lys Val Val Val Glu

180 185 190

Leu Asn Arg Phe Ala Phe Met Ala Met Asp Asn Pro Asn Val Arg Arg

195 200 205

Trp Glu Tyr Gln Gln Gly Pro Leu Tyr Gly Leu Gly Ser Val Glu Asp

210 215 220

Ala Val Tyr Ala Gln Gln Asp Gly His Cys Leu Phe Cys Lys Lys Pro

225 230 235 240

Ile Asp His Tyr His His Val Val Thr Arg His Lys Gly Gly Ser Glu

245 250 255

Thr Leu Ala Asn Arg Cys Gly Leu Cys Ala Lys His His Asp Leu Val

260 265 270

His Lys Asp Lys Ala Trp Thr Glu Lys Leu Val Thr Arg Lys Gly Gly

275 280 285

Met Asn Lys Lys Tyr His Ala Leu Ser Val Leu Asn Gln Ile Ile Pro

290 295 300

His Leu Met Glu His Ile Gly Ser Glu Thr Pro Tyr Asp Ser Tyr Ala

305 310 315 320

Thr Asp Gly Lys Ser Thr Lys Gly Phe Arg Ile Ala Lys Asn Val Pro

325 330 335

Lys Glu His Tyr Thr Asp Ala Tyr Cys Ile Ala Cys Ser Ile Leu Asp

340 345 350

Thr

<210> 64

<211> 489

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-40 effector

<400> 64

Met Ala Met Val Tyr Val Gln Asn Lys Asp Gly Lys Pro Leu Met Pro

1 5 10 15

Thr Thr Arg Tyr Cys Tyr Val Arg Leu Leu Leu Lys Glu Lys Lys Ala

20 25 30

Arg Val Val Cys Thr Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr

35 40 45

Pro Asp Ile Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr

50 55 60

Asn Ile Gly Val Ala Val Val Lys Glu Asp Gly Gln Cys Val Phe Ser

65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Asp Ile Pro Leu Leu Met Lys Lys

85 90 95

Arg Ala Gly Phe Arg Arg Gln His Arg Thr Leu Asp Arg Arg Arg Lys

100 105 110

Arg Gln Arg Arg Ala Arg Ala Ala Gly Thr Thr Ile Ala Glu Gly Ser
115 120 125

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

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

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

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

355 360 365

Phe Arg Arg His Asp Arg Gln Ala Cys Ile Arg Gln Met Val Asp Arg

370 375 380

Lys Tyr Leu Leu His Gly Lys Val Val Ala Ala Asn Arg His Lys Ala

385 390 395 400

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

405 410 415

Asp Val Ala Val Ser Gln Leu Thr Val Lys Pro His Pro Pro Gln Tyr

420 425 430

Lys Asp Met Ser Arg Ile Met Pro Gly Ala Val Met Asp Phe Asp Gly

435 440 445

Ile Val Gly Val Met Gln Ser Ser Ile Val Gly Gln Phe Tyr Lys Ser

450 455 460

Thr Lys Gly His Lys Ala Thr Pro Lys Arg Cys Val Leu Leu Ser Gln

465 470 475 480

Asn Ala Gly Met Val Phe Ile Pro Thr

485

<210> 65

<211> 489

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-41 effector

<400> 65

Met Ala Met Val Tyr Val Gln Asn Lys Asp Gly Lys Pro Leu Met Pro

1 5 10 15

Thr Thr Arg Tyr Cys Tyr Val Arg Leu Leu Leu Lys Glu Lys Lys Ala

20 25 30

Arg Val Val Cys Thr Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr

35 40 45

Pro Asp Ile Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr
50 55 60

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

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

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

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

290 295 300

Phe Leu Met Glu Tyr Leu Gly Ser Glu Thr Leu Tyr Asp Val Tyr Ala
305 310 315 320

Ile Asp Gly Arg Ser Ile Lys Gly Phe Arg Ile Ala Lys Asn Val Pro
325 330 335

Lys Glu His Tyr Thr Asp Ala Tyr Cys Ile Ala Cys Ser Ile Leu Asp
340 345 350

Thr Asp Asn Lys Val Ser Ala Pro Val Glu Pro Phe Glu Leu Lys Gln
355 360 365

Phe Arg Arg His Asp Arg Gln Ala Cys Ile Arg Gln Met Val Asp Arg
370 375 380

Lys Tyr Leu Leu His Gly Lys Val Val Ala Ala Asn Arg His Lys Ala
385 390 395 400

Phe Glu Gln Lys Ser Asp Ser Leu Gln Glu Phe Arg Glu Ala Tyr Ser
405 410 415

Asp Val Ala Val Ser Gln Leu Thr Val Lys Pro His Pro Pro Gln Tyr
420 425 430

Lys Asp Met Ser Arg Ile Met Pro Gly Ala Val Met Asp Phe Asp Gly
435 440 445

Ile Val Gly Val Met Gln Ser Ser Ile Val Gly Gln Phe Tyr Lys Ser
450 455 460

Thr Lys Gly Tyr Lys Ala Thr Pro Lys Arg Cys Val Leu Leu Ser Gln
465 470 475 480

Asn Ala Gly Met Val Phe Ile Pro Thr
485

<210> 66

<211> 168

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-42 effector

<400> 66

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

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

Val Glu Arg Leu Leu Pro Gly Tyr Glu Lys Pro Val Val Cys Pro Ser
130 135 140
Pro Pro Asn Gly Gly Gly Arg Leu Asn Thr Arg Gly Arg Pro Ala Gly
145 150 155 160
Trp Leu Thr Pro Thr Ala Asn His
165

<210> 67

<211> 489

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-43 effector

<400> 67

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

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

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

Leu Asn Arg Phe Ala Phe Met Ala Met Asp Asn Pro Asn Ile Arg Arg
195 200 205
Trp Glu Tyr Gln Gln Gly Pro Leu Cys Gly Leu Gly Ser Val Glu Asp
210 215 220
Ala Val Tyr Ala Gln Gln Asp Gly His Cys Leu Phe Cys Lys Lys Pro

225 230 235 240

Ile Asp His Tyr His His Val Ile Pro Arg His Lys Gly Gly Ser Glu

245 250 255

Thr Leu Ala Asn Arg Cys Gly Leu Cys Ala Lys His His Asp Leu Val

260 265 270

His Lys Asp Lys Ala Trp Ala Asp Lys Leu Val Thr Arg Lys Glu Gly

275 280 285

Met Asn Lys Lys Tyr His Ala Leu Ser Val Leu Asn Gln Ile Ile Pro

290 295 300

Phe Leu Met Glu Tyr Leu Gly Ser Glu Thr Leu Tyr Asp Val Tyr Ala

305 310 315 320

Ile Asp Gly Arg Ser Ile Lys Gly Phe Arg Ile Ala Lys Asn Val Pro

325 330 335

Lys Glu His Tyr Thr Asp Ala Tyr Cys Ile Ala Cys Ser Ile Leu Asp

340 345 350

Thr Asp Asn Lys Val Ser Ala Pro Val Glu Pro Phe Glu Leu Lys Gln

355 360 365

Phe Arg Arg His Asp Arg Gln Ala Cys Ile Arg Gln Met Val Asp Arg

370 375 380

Lys Tyr Leu Leu His Gly Lys Val Val Ala Ala Asn Arg His Lys Ala

385 390 395 400

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

405 410 415

Asp Val Ala Val Ser Gln Leu Thr Val Lys Pro His Pro Pro Gln Tyr

420 425 430

Lys Asp Met Ser Arg Ile Met Pro Gly Ala Val Met Asp Phe Asp Gly

435 440 445

Ile Val Gly Val Met Gln Ser Ser Ile Val Gly Gln Phe Tyr Lys Ser

450 455 460

Thr Lys Gly His Lys Ala Thr Pro Lys Arg Cys Val Leu Leu Ser Gln

465 470 475 480

Asn Ala Gly Met Val Phe Ile Pro Thr
485

<210> 68

<211> 489

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-44 effector

<400> 68

Met Ala Met Val Tyr Val Gln Asn Lys Asp Gly Lys Pro Leu Met Pro
1 5 10 15

Thr Thr Arg Tyr Cys Tyr Val Arg Leu Leu Leu Lys Glu Asn Lys Ala
20 25 30

Arg Val Val Cys Thr Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr
35 40 45

Pro Asp Ile Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr
50 55 60

Asn Ile Gly Val Ala Val Val Lys Glu Asp Gly Gln Cys Val Phe Ser
65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Asp Ile Pro Leu Leu Met Lys Lys
85 90 95

Arg Ala Gly Phe Arg Arg Gln His Arg Thr Leu Asp Arg Arg Arg Lys
100 105 110

Arg Gln Arg Arg Ala Arg Ala Ala Gly Thr Thr Ile Ala Glu Gly Ser
115 120 125

Val Glu Arg Leu Leu Pro Gly Tyr Glu Lys Pro Val Val Cys His Tyr
130 135 140

Ile Arg Asn Lys Ala Ala Arg Phe Asn Asn Arg Ser Arg Pro Ala Gly
145 150 155 160

Trp Leu Thr Pro Thr Ala Asn His Leu Leu Gln Thr His Ile Asn Leu

165 170 175

Ile Ala Lys Val Ala Lys Phe Leu Pro Ile Thr Lys Val Val Val Glu

180 185 190

Leu Asn Arg Phe Ala Phe Met Ala Met Asp Asn Pro Asn Ile His Arg

195 200 205

Trp Glu Tyr Gln Gln Gly Pro Leu Tyr Gly Leu Gly Ser Val Glu Asp

210 215 220

Ala Val Tyr Ala Gln Gln Asp Gly His Cys Leu Cys Cys Lys Lys Pro

225 230 235 240

Ile Asp His Tyr His His Val Ile Pro Arg His Lys Gly Gly Ser Glu

245 250 255

Thr Leu Ala Asn Arg Cys Gly Leu Cys Ala Lys His His Asp Leu Val

260 265 270

His Lys Asp Lys Ala Trp Ala Asp Lys Leu Val Thr Arg Lys Glu Gly

275 280 285

Met Asn Lys Lys Tyr His Ala Leu Ser Val Leu Asn Gln Ile Ile Pro

290 295 300

Phe Leu Met Glu Tyr Leu Gly Ser Glu Thr Leu Tyr Asp Val Tyr Ala

305 310 315 320

Ile Asp Gly Arg Ser Ile Lys Gly Phe Arg Ile Ala Lys Asn Val Pro

325 330 335

Lys Glu His Tyr Thr Asp Ala Tyr Cys Ile Ala Cys Ser Ile Leu Asp

340 345 350

Thr Asp Asn Lys Val Ser Ala Pro Val Glu Pro Phe Glu Leu Lys Gln

355 360 365

Phe Arg Arg His Asp Arg Gln Ala Cys Ile Arg Gln Met Val Asp Arg

370 375 380

Lys Tyr Leu Leu His Gly Lys Val Val Ala Ala Asn Arg His Lys Ala

385 390 395 400

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

405 410 415

Asp Val Ala Val Ser Gln Leu Thr Val Lys Pro His Pro Pro Gln Tyr
420 425 430
Lys Asp Met Ser Arg Ile Met Pro Gly Ala Val Met Asp Phe Asp Gly
435 440 445

Ile Val Gly Val Met Gln Ser Ser Ile Val Gly Gln Phe Tyr Lys Ser
450 455 460
Thr Lys Gly His Lys Ala Thr Pro Lys Arg Cys Val Leu Leu Ser Gln
465 470 475 480
Asn Ala Gly Met Val Phe Ile Pro Thr
485

<210> 69
<211> 494
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-45 effector

<400> 69
Met Ala Met Val Tyr Val Gln Asn Lys Asp Gly Lys Pro Leu Met Pro
1 5 10 15
Thr Thr Arg Tyr Cys Tyr Val Arg Leu Leu Leu Lys Glu Asn Lys Ala
20 25 30
Arg Val Val Ser Thr Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr
35 40 45
Pro Asp Ile Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr
50 55 60

Asn Ile Gly Val Ala Val Val Lys Glu Asp Gly Gln Cys Val Phe Ser
65 70 75 80
Ala His Leu Glu Thr Arg Asn Lys Asp Val Pro Leu Leu Met Gln Lys
85 90 95
Arg Ala Gly Phe Arg Lys Gln His Arg Thr Leu Asp Arg Arg Arg Lys

100 105 110

Arg Gln Arg Arg Ala Lys Val Ala Gly Thr Thr Val Glu Gly Glu Thr

115 120 125

Ile Glu Arg Leu Leu Pro Gly Tyr Glu Lys Pro Val Val Cys His Tyr

130 135 140

Ile Arg Asn Lys Glu Ala Arg Phe Asn Asn Arg Ser Arg Pro Ala Gly

145 150 155 160

Trp Leu Thr Pro Thr Ala Asn His Leu Leu Gln Thr His Ile Asn Leu

165 170 175

Ile Ala Lys Val Ala Lys Phe Leu Pro Ile Thr Lys Val Val Val Glu

180 185 190

Leu Asn Arg Phe Ala Phe Met Ala Met Asp Asn Pro Asn Ile Arg Arg

195 200 205

Trp Glu Tyr Gln Gln Gly Pro Leu Tyr Gly Leu Gly Ser Val Glu Asp

210 215 220

Ala Val Tyr Ala Gln Gln Asp Gly Arg Cys Leu Phe Cys Lys Lys Pro

225 230 235 240

Ile Asp His Tyr His His Val Val Pro Arg His Lys Gly Gly Ser Glu

245 250 255

Thr Leu Ala Asn Arg Cys Gly Leu Cys Arg Glu His His Ala Leu Val

260 265 270

His Thr Asp Lys Val Trp Ala Asp Lys Leu Val Thr Arg Lys Glu Gly

275 280 285

Val Asn Lys Lys Tyr His Ala Leu Ser Val Leu Asn Gln Ile Ile Pro

290 295 300

His Leu Met Glu Tyr Leu Gly Ser Glu Thr Arg Tyr Asp Val Tyr Ala

305 310 315 320

Thr Asp Gly Arg Ser Thr Lys Gly Phe Arg Val Ala Lys Asn Val Pro

325 330 335

Lys Glu His Tyr Thr Asp Ala Tyr Cys Ile Ala Cys Ser Ile Leu Asp

340 345 350

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

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

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

<210> 70
<211> 403
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors

<220><223> Description: MG35-46 effector
<400> 70
Met Ala Arg Lys Leu Leu Asn Ala Gly Lys Ala Ala Val Phe Arg Arg
1 5 10 15
Phe Pro Phe Thr Ile Ile Leu Lys Lys Glu Val Glu Val Thr Pro Lys
20 25 30
Ser Ile Thr Leu Lys Leu Asp Pro Gly Ser Lys Thr Thr Gly Ile Ala

35 40 45

Leu Lys Gln Gly Asp Lys Ile Ile Phe Gly Ala Glu Leu Thr His Arg

50 55 60

Gly Gln Ala Ile Lys Ala Ser Leu Glu Ser Arg Arg Ser Leu Arg Arg
65 70 75 80

Ser Arg Arg Asn Arg His Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn
85 90 95

Arg Thr Arg Pro Asp Gly Trp Leu Ala Pro Ser Leu Gln His Arg Val
100 105 110

Glu Thr Thr Leu Thr Trp Val Asn Lys Leu Ile Arg Leu Val Pro Ile

115 120 125

Gly Ser Ile Val Gln Glu Leu Val Arg Phe Asp Leu Gln Gln Ile Glu
130 135 140

Asn Pro Glu Ile Ser Gly Ile Glu Tyr Gln Gln Gly Glu Leu Ala Gly
145 150 155 160

Tyr Glu Val Arg Glu Tyr Leu Leu Asn Lys Trp Asp Arg Lys Cys Ala
165 170 175

Tyr Cys Ser Ala Glu Asn Ile Pro Leu Gln Val Glu His Ile His Ser

180 185 190

Lys Ala Lys Gly Gly Ser Asn Arg Ile Ser Asn Leu Cys Leu Ala Cys
195 200 205

Glu Lys Cys Asn Leu Lys Lys Gly Thr Gln Asp Ile Asn Val Phe Leu
210 215 220

Ala Lys Lys Pro Asp Leu Leu Lys Arg Ile Leu Ser Gln Ala Lys Arg
225 230 235 240

Pro Leu Lys Asp Ala Ala Ala Val Asn Ser Thr Arg Trp Ala Leu Leu

245 250 255

Asn Arg Leu Gln Glu Thr Gly Leu Pro Val Leu Thr Gly Ser Gly Gly
260 265 270

Gln Thr Lys Phe Asn Arg Thr Arg Leu Asp Leu Pro Lys Thr His Trp
275 280 285

Leu Asp Ala Ala Cys Val Gly His Val Asp Gln Leu Glu Val Leu Thr
290 295 300
Gly Lys Pro Leu Leu Ile Lys Ala Thr Gly His Gly Ser Arg Gln Met

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

370 375 380
Leu Ser His Lys Phe Cys Arg Ser Val His Arg Lys Asp Gly Tyr Gly
385 390 395 400
Tyr Gly Phe

<210> 71
<211> 153
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-47 effector
<400> 71
Met Ala Trp Val Asn Arg Leu Arg Arg Trp Ala Pro Val Thr Ala Leu
1 5 10 15

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

50 55 60

Ala Thr Asp Val Pro Leu Gln Val Glu His Ile Val Pro Lys Ser Lys
65 70 75 80

Gly Gly Ser Asn Arg Ile Ser Asn Leu Cys Leu Ser Cys Ala Asp Cys
85 90 95

Asn Gln Lys Lys Gly Val Leu Pro Val Glu Gly Phe Leu Ala Ser Gln
100 105 110

Pro Asp Arg Leu Lys Arg Ile Leu Ala Gln Ala Thr Pro Gln Ala Gly
115 120 125

Cys Gly Cys Arg Ala Val Val Pro Gly Gly Ala Gly Trp Arg Arg Ala
130 135 140

Gly Asp Gly Glu Thr Arg Pro Ala Ala
145 150

<210> 72

<211> 358

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-48 effector

<400> 72

Met Cys Lys Val Phe Val Leu Asp Thr Asn Lys Gln Pro Leu Met Pro
1 5 10 15

Cys Ser Gln Arg Arg Ala Lys Ile Leu Leu Arg Arg Gly Lys Ala Ala
20 25 30

Val Phe Arg Arg Phe Pro Phe Ala Ile Ile Leu Lys Arg Ser Val Ala
35 40 45

Asp Arg Ser Val Leu Arg Leu Lys Ala Gln Pro Leu Arg Leu Lys Ile
50 55 60

Asp Pro Gly Ser Lys Thr Thr Gly Leu Ala Ile Val Asn Asp Ser Ser
65 70 75 80

Gly Glu Val Leu Phe Gly Ala Glu Leu Glu His Arg Gly Asn Leu Ile
85 90 95

Lys Ala Ala Leu Glu Gly Arg Arg Ala Leu Arg Arg Ser Arg Arg Gln
100 105 110
Arg Lys Thr Arg Tyr Arg Lys Ala Arg Phe Ser Asn Arg Arg Arg Gln
115 120 125
Gln Gly Lys Gly Ile Thr Leu Ser Trp Leu Pro Pro Ser Leu Glu Ser
130 135 140
Arg Val Ala Asn Thr Val Thr Trp Val Asn Arg Leu Arg Arg Leu Cys
145 150 155 160

Ser Ile Arg Ala Ile Ser Gln Glu Leu Ala Arg Phe Asp Thr Gln Leu
165 170 175
Met Gln Asn Gly Glu Ile Ser Gly Val Glu Tyr Gln Gln Gly Glu Leu
180 185 190
Ala Gly Tyr Glu Ile Arg Glu Tyr Leu Leu Glu Lys Phe Asn Arg Lys
195 200 205
Cys Ala Tyr Cys Lys Ser Glu Asn Leu Pro Leu Glu Ile Asp His Ile
210 215 220

Ile Pro Lys Ser Arg Gly Gly Thr Asn Arg Val Ser Asn Leu Thr Thr
225 230 235 240
Ala Cys Arg Ala Cys Asn Cys Lys Lys Gly Asn Leu Thr Ala Glu Glu
245 250 255
Phe Gly Tyr Arg Gln Val Gln Ala Ser Ala Lys Ala Pro Leu Lys Asp
260 265 270
Ala Ala Ala Val Asn Thr Thr Arg Trp Glu Leu Tyr Arg Arg Leu Gln
275 280 285

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

325 330 335

Pro Leu Thr Ile Lys Ala Thr Gly His Gly Arg Arg Gln Arg Cys Arg

340 345 350

Pro Ser Lys Tyr Gly Phe

355

<210> 73

<211> 321

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-49 effector

<400> 73

Met Cys Lys Val Phe Val Leu Asn Ile Asn Lys Gln Pro Leu Thr Pro

1 5 10 15

Cys Ser Pro Arg Arg Ala Lys Ile Leu Leu Gly Lys Gly Lys Ala Ala

20 25 30

Val Phe Arg Arg Phe Pro Phe Thr Ile Ile Leu Lys Arg Ser Val Ala

35 40 45

Asp Ala Ser Val Leu Arg Leu Lys Ala Gln Pro Leu Arg Leu Lys Ile

50 55 60

Asp Pro Gly Ser Lys Thr Thr Gly Leu Ala Ile Val Asn Asp Ser Ser

65 70 75 80

Gly Glu Val Leu Phe Gly Ala Glu Leu Glu His Arg Ser Asn Leu Ile

85 90 95

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

100 105 110

Arg Lys Thr Arg Tyr Arg Lys Ala Arg Phe Ser Asn Arg Arg Arg Gln

115 120 125

Gln Gly Lys Gly Ile Thr Leu Ser Trp Leu Pro Pro Ser Leu Glu Ser

130 135 140

Arg Val Ala Asn Thr Val Thr Trp Val Asn Arg Leu Arg Arg Leu Cys
145 150 155 160

Pro Ile Arg Ala Ile Ser Gln Glu Leu Val Cys Phe Asp Thr Gln Leu
165 170 175
Met His Asn Ala Glu Ile Ser Gly Val Glu Tyr Gln Gln Gly Glu Leu
180 185 190
Ala Gly Tyr Glu Ile Arg Glu Tyr Leu Leu Glu Lys Phe Asn Arg Lys
195 200 205
Cys Ala Tyr Cys Lys Ser Glu Asn Leu Pro Leu Glu Ile Asp His Ile
210 215 220

Ile Pro Lys Ser Arg Gly Gly Thr Asn Arg Val Ser Asn Leu Thr Thr
225 230 235 240
Ala Cys Arg Val Cys Asn Arg Lys Lys Gly Asn Leu Thr Ala Gln Glu
245 250 255
Phe Gly Tyr Pro Gln Val Gln Ala Ser Ala Lys Ala Pro Leu Lys Asp
260 265 270
Ala Ala Ala Val Asn Thr Thr Arg Trp Glu Leu Tyr Arg Arg Leu Gln
275 280 285

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

<210> 74
<211> 494
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-50 effector

<400> 74

Met Asp Met Val Tyr Val Leu Asn Lys Asp Gly Lys Pro Leu Met Ala

1 5 10 15

Thr Thr Arg Gly Gly Arg Val Arg Tyr Leu Leu Lys Glu Lys Lys Ala

20 25 30

Arg Val Val Ser Ser Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr

35 40 45

Pro Asp Ala Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr

50 55 60

Asn Ile Gly Val Ala Val Val Lys Glu Asp Gly Gln Cys Val Phe Ser

65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Glu Val Pro Leu Leu Met Lys Lys

85 90 95

Arg Ala Ala Phe Arg Arg Gln His Arg Thr Gln Asp Arg Arg Arg Lys

100 105 110

Arg Gln Arg Arg Ala Ile Ala Ala Gly Thr Thr Val Glu Ser Asn Thr

115 120 125

Ile Glu Arg Leu Leu Pro Gly Tyr Glu Lys Pro Ile Val Cys His His

130 135 140

Ile Arg Asn Lys Glu Ala Arg Phe Asn Asn Arg Ser Arg Pro Ala Gly

145 150 155 160

Trp Leu Thr Pro Thr Ala Asn His Leu Leu Gln Ala His Ile Asn Leu

165 170 175

Ile Ala Lys Ala Ala Lys Phe Leu Pro Ile Thr Lys Val Val Val Glu

180 185 190

Leu Asn Arg Phe Ala Phe Met Ala Met Asp Asn Pro Asn Ile Arg Arg

195 200 205

Trp Glu Tyr Gln Gln Gly Pro Leu Tyr Gly Leu Gly Ser Val Lys Asp

210 215 220

Ala Val Tyr Ala Gln Gln Asp Gly His Cys Leu Phe Cys Lys Lys Pro

225 230 235 240

Ile Asp His Tyr His His Val Val Pro Arg His Lys Gly Gly Ser Glu
245 250 255
Thr Leu Ala Asn Arg Cys Gly Leu Cys Glu Lys His His Ala Leu Val

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

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

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

450 455 460
Asn Tyr Tyr Asn Ser Thr Lys Gly Glu Arg Phe Leu Thr Arg Ser Cys
465 470 475 480
Val Leu Leu Ala Gln Asn Ala Gly Met Val Phe Ile Pro Ala

485 490

<210> 75

<211> 494

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-51 effector

<400> 75

Met Asp Met Val Tyr Val Leu Asn Lys Asp Gly Lys Pro Leu Met Ala
1 5 10 15

Thr Thr Arg Gly Gly Arg Val Arg Tyr Leu Leu Lys Glu Lys Lys Ala
20 25 30

Arg Val Val Ser Ser Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr
35 40 45

Pro Asp Ala Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr
50 55 60

Asn Ile Gly Val Ala Val Val Lys Glu Asp Gly Ser Cys Val Phe Ser
65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Asp Val Pro Leu Leu Met Lys Lys
85 90 95

Arg Ala Ala Phe Arg Arg Asn His Arg Thr Leu Asp Arg Arg Arg Lys
100 105 110

Arg Gln Arg Arg Ala Lys Ala Ala Gly Thr Thr Ile Ala Glu Gly Ser
115 120 125

Val Glu Arg Leu Leu Pro Gly Tyr Glu Lys Pro Ile Met Cys His His
130 135 140

Ile Arg Asn Lys Glu Ala Arg Phe Asn Asn Arg Ser Arg Pro Ala Gly
145 150 155 160

Trp Leu Thr Pro Thr Ala Asn His Leu Leu Gln Thr His Ile Asn Leu
165 170 175

Ile Ala Lys Val Ala Lys Phe Leu Pro Ile Thr Lys Val Val Val Glu
180 185 190

Leu Asn Arg Phe Ala Phe Met Ala Met Asp Asn Pro Asn Ile Arg Arg
195 200 205

Trp Glu Tyr Gln Gln Gly Pro Leu Cys Gly Leu Gly Ser Val Glu Asp
210 215 220

Ala Val Tyr Ala Gln Gln Asp Gly His Cys Leu Phe Cys Lys Lys Pro
225 230 235 240

Ile Asp His Tyr His His Val Ile Pro Arg His Lys Arg Gly Ser Glu
245 250 255

Thr Leu Ala Asn Arg Cys Gly Leu Cys Ala Lys His His Asp Leu Val
260 265 270

His Thr Asp Lys Ala Trp Ala Asp Lys Leu Val Thr Arg Lys Glu Gly
275 280 285

Met Asn Lys Lys Tyr His Ala Leu Ser Val Leu Asn Gln Ile Ile Pro
290 295 300

His Leu Met Glu Tyr Ile Gly Ser Glu Thr Leu Tyr Asp Ala Tyr Ala
305 310 315 320

Thr Asp Gly Arg Ser Thr Lys Gly Phe Arg Ile Ala Lys Asn Val Pro
325 330 335

Lys Glu His Tyr Thr Asp Ala Tyr Cys Ile Ala Cys Ser Ile Leu Asp
340 345 350

Thr Asp Ile Glu Val Ser Ala Pro Val Glu Pro Phe Glu Met Lys Gln
355 360 365

Phe Arg Arg His Asp Arg Gln Ala Cys Ile Arg Gln Met Val Asp Arg
370 375 380

Lys Tyr Ile Leu Asp Gly Lys Val Val Ala Thr Asn Arg His Lys Ala
385 390 395 400

Ile Glu Gln Lys Ser Asp Ser Leu Glu Glu Phe Arg Glu Ala His Gly
405 410 415

Asn Ala Ala Val Ser Gln Leu Thr Val Lys Pro His His Pro Gln Cys

420 425 430

Lys Asp Met Ala Arg Ile Met Pro Gly Ala Val Met Val Phe Asp Gly

435 440 445

Ala Val Gly Val Phe Gln Gly Ser Ser Gly Arg Asn Asn Gly Thr Pro

450 455 460

Asn Tyr Tyr Asn Ser Thr Lys Gly Glu Arg Phe Leu Thr Arg Ser Cys

465 470 475 480

Val Leu Leu Ala Gln Asn Ala Gly Met Val Phe Ile Pro Ala

485 490

<210> 76

<211> 89

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-52 effector

<400> 76

Met Asp Met Val Tyr Val Leu Asn Lys Asp Gly Lys Pro Leu Met Ala

1 5 10 15

Thr Thr Arg Gly Gly Arg Val Arg Tyr Leu Leu Lys Glu Lys Lys Ala

20 25 30

Arg Val Val Ser Ser Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr

35 40 45

Pro Asp Ile Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr

50 55 60

Asn Ile Gly Phe Ala Val Val Lys Glu Asp Gly Gln Cys Val Phe Ser

65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Asp

85

<210> 77

<211> 494

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-53 effector

<400> 77

Met Asp Met Val Tyr Val Leu Asn Lys Asp Gly Lys Pro Leu Met Ala

1 5 10 15

Thr Thr Arg Gly Gly Arg Val Arg Tyr Leu Leu Lys Glu Lys Lys Ala

20 25 30

Arg Val Val Ser Ser Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr

35 40 45

Pro Asp Ile Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr

50 55 60

Asn Ile Gly Val Ala Val Val Lys Glu Asp Gly Gln Cys Val Phe Ser

65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Asp Ile Pro Leu Leu Met Lys Lys

85 90 95

Arg Ala Gly Phe Arg Arg Gln His Arg Thr Leu Asp Arg Arg Arg Lys

100 105 110

Arg Gln Arg Arg Ala Lys Ala Ala Gly Thr Thr Val Ala Glu Gly Ser

115 120 125

Val Glu Arg Leu Leu Pro Gly Tyr Glu Lys Pro Val Val Cys His His

130 135 140

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

145 150 155 160

Trp Leu Thr Pro Thr Ala Asn His Leu Leu Gln Thr His Ile Asn Leu

165 170 175

Ile Ala Lys Val Val Lys Phe Leu Pro Ile Thr Lys Val Val Val Glu

180 185 190

Leu Asn Arg Phe Ala Phe Met Ala Met Asp Asn Pro Asn Ile His Arg

195 200 205

Trp Glu Tyr Gln Gln Gly Pro Leu Tyr Gly Leu Gly Ser Val Glu Asp

210 215 220

Ala Val Tyr Ala Gln Gln Asp Gly His Cys Leu Phe Cys Lys Lys Pro

225 230 235 240

Ile Asp His Tyr His His Val Val Pro Arg His Lys Gly Gly Ser Glu

245 250 255

Thr Leu Val Asn Arg Cys Gly Leu Cys Thr Glu His His Ser Leu Val

260 265 270

His Thr Asp Lys Val Trp Ala Asp Lys Leu Val Thr Arg Lys Glu Gly

275 280 285

Met Asn Lys Lys Tyr His Ala Leu Ser Val Leu Asn Gln Ile Ile Pro

290 295 300

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

305 310 315 320

Thr Asp Gly Arg Ser Thr Lys Gly Phe Arg Ile Ala Lys Asn Val Pro

325 330 335

Lys Glu His Tyr Thr Asp Ala Tyr Cys Ile Ala Cys Ser Ile Leu Asp

340 345 350

Thr Asp Ile Glu Val Ser Ala Pro Val Glu Pro Phe Glu Leu Lys Gln

355 360 365

Phe Arg Arg His Asp Arg Gln Ala Cys Ile Arg Gln Met Ala Asp Arg

370 375 380

Lys Tyr Leu Leu Asp Gly Lys Val Val Ala Ala Asn Arg His Lys Ala

385 390 395 400

Ile Glu Gln Lys Ser Asp Cys Leu Ala Glu Phe Arg Glu Ala Cys Gly

405 410 415

Ala Ala Val Val Ser Gln Leu Thr Val Lys Pro His Pro Pro Gln Tyr

420 425 430

Lys Asp Met Ala Arg Ile Met Pro Gly Ala Val Met Asp Phe Asn Gly

435 440 445

Thr Ile Gly Val Met Gln Cys Ser Ser Gly Arg Asn Asn Gly Gly Val

450 455 460

Asp Tyr Phe Lys Ser Thr Lys Gly His Lys Ala Thr Pro Lys Arg Cys

465 470 475 480

Val Leu Leu Thr Gln Asn Ala Gly Met Val Phe Ile Pro Thr

485 490

<210> 78

<211> 489

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-54 effector

<400> 78

Met Asp Met Val Tyr Val Leu Asn Lys Asp Gly Lys Pro Leu Met Ala

1 5 10 15

Thr Thr Arg Gly Gly Arg Val Arg Tyr Leu Leu Lys Glu Lys Lys Ala

20 25 30

Arg Val Val Ser Ser Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr

35 40 45

Pro Asp Ile Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr

50 55 60

Asn Ile Gly Val Ala Val Val Lys Glu Asp Gly Gln Cys Val Phe Ser

65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Asp Ile Pro Leu Leu Met Lys Lys

85 90 95

Arg Ala Gly Phe Arg Arg Gln His Arg Thr Leu Asp Arg Arg Arg Lys

100 105 110

Arg Gln Arg Arg Ala Lys Ala Ala Gly Thr Thr Val Ala Glu Gly Ser

115 120 125

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

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

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

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

Phe Arg Arg His Asp Arg Gln Ala Cys Ile Arg Gln Met Val Asp Arg
370 375 380

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

Ile Val Gly Val Met Gln Ser Ser Ile Val Gly Gln Phe Tyr Lys Ser
450 455 460
Thr Lys Gly His Lys Ala Thr Pro Lys Arg Cys Ala Leu Leu Ser Gln
465 470 475 480
Asn Ala Gly Met Val Phe Ile Pro Thr
485

<210> 79
<211> 97
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-55 effector

<400> 79
Met Asp Met Val Tyr Val Leu Asn Lys Asp Gly Lys Pro Leu Met Ala
1 5 10 15
Thr Thr Arg Gly Gly Arg Val Arg Tyr Leu Leu Lys Glu Lys Lys Ala
20 25 30
Arg Val Val Ser Ser Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr
35 40 45
Pro Asp Ile Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr

50 55 60

Asn Ile Gly Val Ala Val Val Lys Glu Asp Gly Gln Cys Val Phe Ser
65 70 75 80
Ala His Leu Glu Thr Arg Asn Lys Asp Val Pro Leu Leu Met Gln Lys
85 90 95
Arg

<210> 80
<211> 343
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-56 effector
<400> 80
Met Asp Met Val Tyr Val Leu Asn Lys Asp Gly Lys Pro Leu Met Ala

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

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

Ile Glu Arg Leu Leu Pro Gly Tyr Glu Lys Pro Ile Val Cys His His

130 135 140

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

195 200 205

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

260 265 270

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

325 330 335

Lys Glu His Tyr Thr Asp Ala
340

<210> 81

<211> 149

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-57 effector

<400> 81

Met Asp Met Val Tyr Val Leu Asn Lys Asp Gly Lys Pro Leu Met Ala
1 5 10 15

Thr Thr Arg Gly Gly Arg Val Arg Tyr Leu Leu Lys Glu Lys Lys Ala
20 25 30

Arg Val Val Ser Ser Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr
35 40 45

Pro Asp Val Thr Gln Asp Leu Ile Leu Gly Val Asp Pro Gly Arg Thr
50 55 60

Asn Ile Gly Val Ala Val Val Lys Glu Asp Gly Gln Cys Val Phe Ser
65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Asp Val Pro Leu Leu Met Lys Lys
85 90 95

Arg Ala Ala Phe Arg Arg Asn His Arg Thr Leu Asp Arg Arg Arg Lys
100 105 110

Arg Gln Arg Arg Ala Lys Ala Ala Gly Thr Thr Ile Ala Glu Gly Ser
115 120 125

Val Glu Arg Leu Leu Pro Gly Tyr Glu Lys Pro Ile Met Cys His His
130 135 140

Ile Arg Asn Lys Glu
145

<210

> 82

<211> 260

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-58 effector

<400> 82

Met Glu Asn Pro Asp Ile Ser Gly Val Glu Tyr Gln Gln Gly Glu Leu
1 5 10 15

Gln Gly Tyr Asp Val Arg Glu Tyr Leu Leu Glu Lys Trp Gly Arg Thr
20 25 30

Cys Ala Tyr Cys Gly Val Gln Asn Val Pro Leu Asp Val Glu His Ile
35 40 45

Gln Pro Arg Ser Lys Gly Gly Ser Asp Arg Val Ser Asn Leu Thr Ile
50 55 60

Ala Cys Arg Ser Cys Asn Gln Ala Lys Gly Asn Glu Asp Ile Arg Asp
65 70 75 80

Phe Leu Ser Gly Gln Pro Asp Val Leu Ser Arg Leu Leu Arg Gln Ala
85 90 95

Lys Ser Pro Leu Asn Asp Ala Ala Ala Val Asn Ser Thr Arg Trp Ala
100 105 110

Leu Phe Lys Ala Leu Lys Ala Thr Gly Val Pro Val Thr Thr Gly Thr
115 120 125

Gly Gly Gln Thr Lys Phe Asn Arg Leu Arg Phe Asn Leu Pro Lys Ala
130 135 140

His Trp Leu Asp Ala Ala Cys Val Gly Asp Val Glu Ser Leu Asp Ile
145 150 155 160

Val Thr Ser Ile Pro Leu Met Ile Arg Ala Lys Gly His Gly Thr Arg
165 170 175

Arg Met Cys Gly Thr Asn Lys Tyr Gly Phe Pro Thr Arg His Arg Ser
180 185 190

Arg Arg Gln Ile His Asn Gly Phe Gln Thr Gly Asp Ile Val Thr Ala
195 200 205

Thr Val Thr Ala Gly Lys Lys Ile Gly Ser Tyr Val Gly Arg Val Leu
210 215 220

Cys Arg Ala Ser Gly Ser Phe Asp Ile Thr Thr Ala Ser Gly Arg Val

225 230 235 240

Thr Gly Ile Asn His Lys Tyr Cys Lys Pro Ile His Arg Lys Asp Gly

245 250 255

Tyr Ala Tyr Ala

260

<210> 83

<211> 260

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-59 effector

<400> 83

Met Glu Asn Pro Asp Ile Ser Gly Val Glu Tyr Gln Gln Gly Glu Leu

1 5 10 15

Gln Gly Tyr Asp Val Arg Glu Tyr Leu Leu Glu Lys Trp Gly Arg Thr

20 25 30

Cys Ala Tyr Cys Gly Val Gln Asn Val Pro Leu Asp Val Glu His Ile

35 40 45

Gln Pro Arg Ser Lys Gly Gly Ser Asp Arg Val Ser Asn Leu Thr Ile

50 55 60

Ala Cys Arg Ser Cys Asn Gln Ala Lys Gly Asn Glu Asp Ile Arg Asp

65 70 75 80

Phe Leu Ser Gly Gln Pro Asp Val Leu Ser Arg Leu Leu Arg Gln Ala

85 90 95

Lys Ser Pro Leu Asn Asp Ala Ala Ala Val Asn Ser Thr Arg Trp Ala

100 105 110

Leu Phe Lys Ala Leu Lys Ala Thr Gly Val Pro Val Thr Thr Gly Thr

115 120 125

Gly Gly Gln Thr Lys Phe Asn Arg Leu Arg Phe Asn Leu Pro Lys Ala

130 135 140

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

Thr Val Thr Ala Gly Lys Lys Ile Gly Ser Tyr Val Gly Arg Val Leu
210 215 220
Cys Arg Ala Ser Gly Ser Phe Asp Ile Thr Thr Ala Ser Gly Arg Val
225 230 235 240
Thr Gly Ile Asn His Lys Tyr Cys Lys Pro Ile His Arg Lys Asp Gly
245 250 255
Tyr Ala Tyr Ala
260

<210> 84
<211> 429
<212> PRT
<213> Unknown
<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors
<220><223> Description: MG35-60 effector
<400> 84
Met Glu Thr Phe Lys Cys Pro Ile Leu Tyr Leu Phe Ser Thr Arg Thr
1 5 10 15
Ser Asp Pro Leu Thr Ser Val His Pro Gly Thr Ala Arg His Leu Leu
20 25 30
Asn Ser Gly Glu Ala Ala Val Leu Arg Arg Phe Pro Phe Ser Ile Ile

35 40 45

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

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

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

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

Thr Gly Leu Pro Val Thr Thr Gly Thr Gly Gly Gln Thr Lys Phe Asn
290 295 300

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

Phe Gln Thr Gly Asp Ile Val Lys Ala Thr Val Thr Ala Gly Gln Lys
370 375 380
Ile Gly Ser Tyr Arg Gly Arg Val Leu Cys Arg Ala Ser Gly Ser Phe
385 390 395 400
Asp Ile Val Thr Thr Ala Ala Arg Val Ser Gly Ile Ser His Lys Tyr
405 410 415
Cys Gln Pro Ile His Lys Lys Asp Gly Tyr Ser Tyr Gly
420 425

<210> 85

<211> 258
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-61 effector
<400> 85
Met Phe Gly Tyr Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu Asn
1 5 10 15
Tyr Thr Cys Ile Tyr Cys Gly Ile His Ala Ser Lys Ala Lys Met Glu
20 25 30

Ile Glu His Val Ile Pro Arg Ser Arg Gly Gly Thr Asp Ser Leu Asn

35 40 45

Asn Leu Val Leu Ser Cys His Glu Cys Asn Gln Ala Lys Gly Lys Leu

50 55 60

Ser Leu Ser Glu Tyr Leu Lys Gly Lys Pro Asn Val Leu Arg Arg Val

65 70 75 80

Lys Ala Arg Leu Asn Thr Asn Tyr Arg Asp Ala Ala His Thr Asn Ser

85 90 95

Ile Arg Leu Phe Val Leu Asn Lys Leu Gln Thr Met Ala Asp Ala Ile

100 105 110

Gly Thr Asn Leu Asn Val Gly Phe Gly Tyr Thr Thr Lys Gln Asn Arg

115 120 125

Leu Leu Leu Asn Leu Pro Lys Asp His Trp Ile Asp Ala Ala Val Cys

130 135 140

Thr Lys Asp Gly Asn Ala Val Lys Val Glu Pro Ser Leu Lys Pro Leu

145 150 155 160

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

165 170 175

Lys Tyr Gly Phe Pro Arg Thr Ser Pro Lys Pro Arg Ser Lys Asn Phe

180 185 190

Phe Gly Phe Lys Thr Gly Asp Met Val Lys Val Val Val Pro Leu Gly

195 200 205

Ser Lys Thr Lys Val Pro Val Gly Thr His Thr Gly Arg Val Ala Val

210 215 220

Arg Ser Ser Gly Ser Phe Asp Val Lys Thr Arg Asp Ala Lys Leu Gly

225 230 235 240

Ile Tyr His Lys Tyr Cys Gln Gln Ile His Leu Met Asp Gly Tyr Ser

245 250 255

Tyr Ala

<210> 86

<211> 446

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-62 effector

<400> 86

Met Phe Lys Gln Pro Asn Phe Asn Lys Ala Leu Val Leu Asp Thr Asn
1 5 10 15

Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala Arg Ala Lys Lys Leu Leu
20 25 30

Asn Ser Gly Arg Ala Ser Val Phe Arg Arg Phe Pro Phe Thr Ile Ile
35 40 45

Leu His Asp Arg Thr Leu Glu Glu Ser Lys Leu Gln Asp Met Glu Ile
50 55 60

Lys Ile Asp Gln Gly Ser Lys Thr Thr Gly Val Ala Leu Ile Val His
65 70 75 80

Gly Lys Lys Ser Ser Thr Val Thr Leu Ala Ala His Ile Glu His Arg
85 90 95

Thr Asn Val Lys Ser Gly Leu Asp Ser Arg Arg Ala Ile Arg Arg Ser
100 105 110

Arg Arg His Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn Arg
115 120 125

Thr Lys Pro Lys Gly Trp Leu Pro Pro Ser Leu Val Ser Lys Ala Glu
130 135 140

Asn Ile Leu Asn Trp Val Ile Arg Phe Ala Lys Leu Thr Pro Leu Thr
145 150 155 160

Lys Phe Ala Leu Glu Thr Ala Lys Phe Asp Met Gln Lys Leu Val Asn
165 170 175

Pro Asn Ile Gln Gly Val Val Tyr Gln Gln Gly Arg Met Phe Gly Tyr
180 185 190

Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu Gln Gly Cys Cys Ile
195 200 205

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

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

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

Val Pro Thr Gly Thr Tyr Thr Gly Arg Val Ala Val Arg Ser Lys Gly
405 410 415
Ser Phe Asp Val Lys Thr Arg Asp Thr Lys Leu Thr Val Ser His Lys
420 425 430
Tyr Cys Lys Gln Ile His Leu Met Asp Gly Tyr Ser Tyr Ala

435 440 445

<210> 87

<211> 301

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-63 effector

<400> 87

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

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

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

Pro Asp Ile Gln Gly Val Gly Tyr Gln Gln Gly Arg Met Phe Gly Tyr

180 185 190

Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu Gln Arg Cys Cys Ile

195 200 205

Tyr Cys Gly Thr His Ala Ser Lys Ala Lys Met Glu Ile Glu His Val

210 215 220

Val Pro Arg Ser Arg Gly Gly Thr Asp Ser Leu Asn Asn Leu Val Leu

225 230 235 240

Ser Cys His Ala Cys Asn Gln Ala Lys Gly Asn Leu Ser Leu Ser Glu

245 250 255

Tyr Leu Lys Gly Lys Pro Ser Val Leu Lys Arg Val Lys Ser His Leu

260 265 270

Gly Ile Asn Tyr Arg Asp Ala Ala His Thr Asn Ser Ile Arg Leu Tyr

275 280 285

Val Met Asn Lys Leu Arg Val Met Ala Glu Ala Ile Gly

290 295 300

<210> 88

<211> 446

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-64 effector

<400> 88

Met Phe Lys Gln Pro Asn Phe Asn Lys Val Leu Val Leu Asp Thr Asn

1 5 10 15

Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala Arg Ala Lys Lys Leu Leu

20 25 30

Asn Ser Gly Arg Ala Ser Val Phe Arg Arg Phe Pro Phe Thr Ile Ile

35 40 45

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

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

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

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

290 295 300

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

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

Tyr Cys Lys Gln Ile His Leu Met Asp Gly Tyr Ser Tyr Ala
435 440 445

<210> 89
<211> 224
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-65 effector
<400> 89
Met Phe Lys Gln Pro Asn Phe Asn Lys Val Leu Val Leu Asp Thr Asn
1 5 10 15
Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala Arg Ala Lys Lys Leu Leu

20 25 30

Asn Ser Gly Arg Ala Ser Val Phe Arg Arg Phe Pro Phe Thr Ile Ile

35 40 45

Leu His Asp Arg Thr Leu Glu Glu Ser Lys Leu Gln Asp Met Glu Ile

50 55 60

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

65 70 75 80

Gly Lys Lys Ser Ser Thr Val Thr Leu Ala Ala His Ile Glu His Arg

85 90 95

Thr Asn Val Lys Ser Gly Leu Asp Ser Arg Arg Ala Ile Arg Arg Ser

100 105 110

Arg Arg His Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn Arg

115 120 125

Thr Lys Pro Lys Gly Trp Leu Pro Pro Ser Leu Val Ser Lys Ala Glu

130 135 140

Asn Ile Leu Asn Trp Val Ile Arg Phe Ala Lys Leu Thr Pro Leu Thr

145 150 155 160

Lys Phe Ala Leu Glu Thr Ala Lys Phe Asp Met Gln Lys Leu Ala Asn

165 170 175

Pro Asn Ile Glu Gly Val Gly Tyr Gln Gln Gly Arg Met Phe Gly Tyr

180 185 190

Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu Gln Gly Cys Cys Ile

195 200 205

Tyr Cys Gly Ile His Ala Ser Lys Ala Lys Met Glu Ile Glu His Val

210 215 220

<210> 90

<211> 446

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-66 effector

<400> 90

Met Phe Lys Gln Pro Asn Phe Asn Lys Val Leu Val Leu Asp Thr Asn
1 5 10 15

Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala Arg Ala Lys Lys Leu Leu
20 25 30

Asn Ser Gly Arg Ala Ser Val Phe Arg Arg Phe Pro Phe Thr Ile Ile
35 40 45

Leu His Asp Arg Thr Leu Glu Glu Ser Lys Leu Gln Asp Met Glu Ile
50 55 60

Lys Ile Asp Gln Gly Ser Lys Thr Thr Gly Val Ala Leu Ile Val His
65 70 75 80

Gly Lys Lys Ser Ser Thr Val Thr Leu Ala Ala His Ile Glu His Arg
85 90 95

Thr Asn Val Lys Ser Gly Leu Asp Ser Arg Arg Ala Ile Arg Arg Ser
100 105 110

Arg Arg His Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn Arg
115 120 125

Thr Lys Pro Lys Gly Trp Leu Pro Pro Ser Leu Val Ser Lys Ala Glu
130 135 140

Asn Ile Leu Asn Trp Val Ile Arg Phe Ala Lys Leu Thr Pro Leu Thr
145 150 155 160

Lys Phe Ala Leu Glu Thr Ala Lys Phe Asp Met Gln Lys Leu Ala Asn
165 170 175

Pro Asn Ile Glu Gly Val Gly Tyr Gln Gln Gly Arg Met Phe Gly Tyr
180 185 190

Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu Gln Gly Cys Cys Ile
195 200 205

Tyr Cys Gly Ile His Ala Ser Lys Ala Lys Met Glu Ile Glu His Val
210 215 220

Ile Pro Arg Ser Arg Gly Gly Thr Asp Ser Leu Asn Asn Leu Val Leu

225 230 235 240

Ser Cys His Ala Cys Asn Gln Ala Lys Gly Asn Leu Ser Leu His Glu

245 250 255

Tyr Leu Lys Gly Lys Pro Ser Val Leu Lys Arg Val Lys Ala His Leu

260 265 270

Gly Ile Asn Tyr Arg Asp Ala Ala His Thr Asn Ser Ile Arg Leu Tyr

275 280 285

Val Met Asn Lys Leu Arg Ala Met Ala Glu Ala Ile Gly Ala Lys Leu

290 295 300

Val Val Gly Phe Gly Ser Thr Thr Lys Gln Asn Arg Leu Leu Leu Gly

305 310 315 320

Leu Pro Lys Asp His Trp Ile Asp Ala Ala Val Cys Thr Lys Asp Gly

325 330 335

Ala Ser Val Arg Val Glu Pro Ala Leu Lys Pro Leu Val Ile Lys Ala

340 345 350

Val Gly Arg Gly Ser Arg Gln Phe Cys Arg Met Asp Lys His Gly Phe

355 360 365

Pro Arg Thr Ser Pro Lys Pro Arg Ser Lys Asn Phe Phe Gly Phe Lys

370 375 380

Thr Gly Asp Met Val Lys Val Ile Val Pro Thr Gly Ala Lys Thr Lys

385 390 395 400

Val Pro Thr Gly Thr Tyr Thr Gly Arg Val Ala Val Arg Ser Lys Gly

405 410 415

Ser Phe Asp Val Lys Thr Arg Asp Thr Lys Leu Thr Val Ser His Lys

420 425 430

Tyr Cys Lys Gln Ile His Leu Met Asp Gly Tyr Ser Tyr Ala

435 440 445

<210> 91

<211> 446

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-67 effector

<400> 91

Met Phe Lys Gln Pro Asn Phe Asn Lys Val Leu Val Leu Asp Thr Asn

1 5 10 15

Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala Arg Ala Lys Lys Leu Leu

20 25 30

Asn Ser Gly Arg Ala Ser Val Phe Arg Arg Phe Pro Phe Thr Ile Ile

35 40 45

Leu His Asp Arg Thr Leu Glu Glu Ser Lys Leu Gln Asp Met Glu Ile

50 55 60

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

65 70 75 80

Gly Lys Lys Ser Ser Thr Val Thr Leu Ala Ala His Ile Glu His Arg

85 90 95

Thr Asn Val Lys Ser Gly Leu Asp Ser Arg Arg Ala Ile Arg Arg Ser

100 105 110

Arg Arg His Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn Arg

115 120 125

Thr Lys Pro Lys Gly Trp Leu Pro Pro Ser Leu Val Ser Lys Ala Glu

130 135 140

Asn Ile Leu Asn Trp Val Ile Arg Phe Ala Lys Leu Thr Pro Leu Thr

145 150 155 160

Lys Phe Ala Leu Glu Thr Ala Lys Phe Asp Met Gln Lys Leu Val Asn

165 170 175

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

180 185 190

Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu Gln Gly Cys Cys Ile

195 200 205

Tyr Cys Gly Ile His Ala Ser Lys Ala Lys Met Lys Ile Glu His Val

210 215 220

Ile Pro Arg Ser Arg Gly Gly Thr Asp Ser Leu Asn Asn Leu Val Leu

225 230 235 240

Ser Cys His Ala Cys Asn Gln Ala Lys Gly Asn Leu Ser Leu Ser Glu

245 250 255

Tyr Leu Lys Gly Lys Pro Ser Val Leu Lys Arg Val Lys Ala His Leu

260 265 270

Gly Ile Asn Tyr Arg Asp Ala Ala His Thr Asn Ser Ile Arg Leu Tyr

275 280 285

Val Met Asn Lys Leu Arg Ala Met Ala Glu Ala Ile Gly Ala Lys Leu

290 295 300

Val Val Trp Phe Gly Ser Thr Thr Lys Gln Asn Arg Leu Leu Leu Gly

305 310 315 320

Leu Pro Lys Asp His Trp Ile Asp Ala Ala Val Cys Thr Lys Asp Gly

325 330 335

Ala Ser Val Arg Val Glu Pro Ala Leu Lys Pro Leu Val Ile Lys Ala

340 345 350

Val Gly Arg Gly Ser Arg Gln Phe Cys Arg Met Asp Lys Tyr Gly Phe

355 360 365

Pro Arg Thr Ser Pro Lys Pro Arg Ser Lys Asn Phe Phe Gly Phe Lys

370 375 380

Thr Gly Asp Met Val Lys Val Ile Val Pro Thr Gly Thr Lys Thr Lys

385 390 395 400

Val Pro Thr Gly Thr Tyr Thr Gly Arg Val Ala Val Arg Ser Ser Gly

405 410 415

Tyr Phe Asp Val Lys Thr Arg Asp Ala Lys Leu Thr Val Ser His Lys

420 425 430

Tyr Cys Gln Pro Ile Tyr Leu Met Asp Gly Tyr Asn Tyr Val

435 440 445

<210> 92

<211> 229

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-68 effector

<400> 92

Met Phe Lys Gln Pro Asn Phe Asn Lys Val Leu Val Leu Asp Thr Asn
1 5 10 15

Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala Arg Ala Lys Lys Leu Leu
20 25 30

Asn Ser Gly Arg Ala Ser Val Phe Arg Arg Phe Pro Phe Thr Ile Ile
35 40 45

Leu His Asp Arg Thr Leu Glu Glu Ser Lys Leu Gln Asp Met Glu Ile
50 55 60

Lys Ile Asp Gln Gly Ser Lys Thr Thr Gly Val Ala Leu Ile Val His
65 70 75 80

Gly Lys Lys Ser Ser Thr Val Thr Leu Ala Ala His Ile Glu His Arg
85 90 95

Thr Asn Val Lys Ser Gly Leu Asp Ser Arg Arg Ala Ile Arg Arg Ser
100 105 110

Arg Arg His Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn Arg
115 120 125

Thr Lys Pro Lys Gly Trp Leu Pro Pro Ser Leu Val Ser Lys Ala Glu
130 135 140

Asn Ile Leu Asn Trp Val Ile Arg Phe Ala Lys Leu Thr Pro Leu Thr
145 150 155 160

Lys Phe Ala Leu Glu Thr Ala Lys Phe Asp Met Gln Lys Leu Val Asn
165 170 175

Pro Asn Ile Gln Gly Val Val Tyr Gln Gln Gly Arg Met Phe Gly Tyr
180 185 190

Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu Gln Arg Cys Cys Ile

195 200 205

Tyr Cys Gly Ile His Ala Ser Lys Ala Lys Met Glu Ile Glu His Val

210 215 220

Ile Pro Arg Ser Arg

225

<210> 93

<211> 446

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-69 effector

<400> 93

Met Phe Lys Gln Pro Asn Phe Asn Lys Val Leu Val Leu Asp Thr Asn

1 5 10 15

Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala Arg Ala Lys Lys Leu Leu

20 25 30

Asn Ser Gly Arg Ala Ser Val Phe Arg Arg Phe Pro Phe Thr Ile Ile

35 40 45

Leu His Asp Arg Thr Leu Glu Glu Ser Lys Leu Gln Asp Met Glu Ile

50 55 60

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

65 70 75 80

Gly Lys Lys Ser Ser Thr Val Thr Leu Ala Ala His Ile Glu His Arg

85 90 95

Thr Asn Val Lys Ser Gly Leu Asp Ser Arg Arg Ala Ile Arg Arg Ser

100 105 110

Arg Arg His Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn Arg

115 120 125

Thr Lys Pro Lys Gly Trp Leu Pro Pro Ser Leu Val Ser Lys Ala Glu

130 135 140

Asn Ile Leu Asn Trp Val Ile Arg Phe Ala Lys Leu Thr Pro Leu Thr
145 150 155 160
Lys Phe Ala Leu Glu Thr Ala Lys Phe Asp Met Gln Lys Leu Val Asn
165 170 175

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

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

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

Pro Arg Thr Ser Pro Lys Pro Arg Ser Lys Asn Phe Phe Gly Phe Lys
370 375 380
Thr Gly Asp Met Val Lys Val Ile Val Pro Thr Gly Ala Lys Thr Lys

385 390 395 400

Val Pro Thr Gly Thr Tyr Thr Gly Arg Val Ala Val Arg Ser Lys Gly

405 410 415

Ser Phe Asp Val Lys Thr Arg Asp Thr Lys Leu Thr Val Ser His Lys

420 425 430

Tyr Cys Lys Gln Ile His Leu Met Asp Gly Tyr Ser Tyr Ala

435 440 445

<210> 94

<211> 446

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-70 effector

<400> 94

Met Phe Lys Gln Pro Asn Phe Asn Lys Val Leu Val Leu Asp Thr Asn

1 5 10 15

Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala Arg Ala Lys Lys Leu Leu

20 25 30

Asn Ser Gly Arg Ala Ser Val Phe Arg Arg Phe Pro Phe Thr Ile Ile

35 40 45

Leu His Asp Arg Thr Leu Glu Glu Ser Lys Leu Gln Asp Met Glu Ile

50 55 60

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

65 70 75 80

Gly Lys Lys Ser Ser Thr Val Thr Leu Ala Ala His Ile Glu His Arg

85 90 95

Thr Asn Val Lys Ser Gly Leu Asp Ser Arg Arg Ala Ile Arg Arg Ser

100 105 110

Arg Arg His Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn Arg

115 120 125

Thr Lys Pro Lys Gly Trp Leu Pro Pro Ser Leu Val Ser Lys Ala Glu

130 135 140

Asn Ile Leu Asn Trp Val Ile Arg Phe Ala Lys Leu Thr Pro Leu Thr

145 150 155 160

Lys Phe Ala Leu Glu Thr Ala Lys Phe Asp Met Gln Lys Leu Val Asn

165 170 175

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

180 185 190

Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu Gln Arg Cys Cys Ile

195 200 205

Tyr Cys Gly Ile His Ala Ser Lys Ala Lys Met Glu Ile Glu His Val

210 215 220

Ile Pro Arg Ser Arg Gly Gly Thr Asp Ser Leu Asn Asn Leu Val Leu

225 230 235 240

Ser Cys His Ala Cys Asn Gln Ala Lys Gly Asn Leu Ser Leu Ser Glu

245 250 255

Tyr Leu Lys Gly Lys Pro Ser Val Leu Lys Arg Val Lys Ala His Leu

260 265 270

Gly Ile Asn Tyr Arg Asp Ala Ala His Thr Asn Ser Ile Arg Leu Tyr

275 280 285

Val Met Asn Lys Leu Arg Ala Met Ala Glu Ala Ile Gly Ala Lys Leu

290 295 300

Val Val Gly Phe Gly Ser Thr Thr Lys Gln Asn Arg Leu Leu Leu Gly

305 310 315 320

Leu Pro Lys Asp His Trp Ile Asp Ala Ala Val Cys Thr Lys Asp Gly

325 330 335

Ala Ser Val Arg Val Glu Pro Ala Leu Lys Pro Leu Val Ile Lys Ala

340 345 350

Val Gly Arg Gly Ser Arg Gln Phe Cys Arg Met Asp Lys Tyr Gly Phe

355 360 365

Pro Arg Thr Ser Pro Lys Pro Arg Ser Lys Asn Phe Phe Gly Phe Lys

370 375 380

Thr Gly Asp Met Val Lys Val Ile Val Pro Thr Gly Ala Lys Thr Lys

385 390 395 400

Val Pro Thr Gly Thr Tyr Thr Gly Arg Val Ala Val Arg Ser Lys Gly

405 410 415

Ser Phe Asp Val Lys Thr Arg Asp Thr Lys Leu Thr Val Ser His Lys

420 425 430

Tyr Cys Lys Gln Ile His Leu Met Asp Gly Tyr Ser Tyr Ala

435 440 445

<210> 95

<211> 312

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-71 effector

<400> 95

Met Phe Lys Gln Pro Asn Phe Asn Lys Val Leu Val Leu Asp Thr Asn

1 5 10 15

Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala Arg Ala Lys Lys Leu Leu

20 25 30

Asn Ser Gly Arg Ala Ser Val Phe Arg Arg Phe Pro Phe Thr Ile Ile

35 40 45

Leu His Asp Arg Thr Leu Glu Lys Ser Lys Leu Gln Asp Met Glu Ile

50 55 60

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

65 70 75 80

Gly Lys Lys Ser Ser Thr Val Thr Leu Ala Ala His Ile Glu His Arg

85 90 95

Thr Asn Val Lys Ser Gly Leu Asp Ser Arg Arg Ala Ile Arg Arg Ser

100 105 110

Arg Arg His Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn Arg
115 120 125

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

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

Tyr Leu Lys Gly Lys Pro Ser Val Leu Lys Arg Val Lys Ala His Leu
260 265 270
Gly Ile Asn Tyr Arg Asp Ala Ala His Thr Asn Ser Ile Arg Leu Tyr
275 280 285
Val Met Asn Lys Leu Arg Ala Met Ala Glu Ala Ile Gly Ala Lys Leu
290 295 300
Val Val Gly Phe Gly Ser Thr Thr
305 310
<210> 96
<211> 446
<212> PRT
<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-72 effector

<400> 96

Met Phe Lys Gln Pro Asn Phe Asn Lys Val Leu Val Leu Asp Thr Asn
1 5 10 15

Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala Arg Ala Lys Lys Leu Leu
20 25 30

Asn Ser Gly Arg Ala Ser Val Phe Arg Arg Phe Pro Phe Thr Ile Ile
35 40 45

Leu His Asp Arg Thr Val Glu Glu Ser Glu Leu Gln Asp Thr Glu Ile
50 55 60

Lys Ile Asp Gln Gly Ser Lys Thr Thr Gly Val Ala Leu Leu Val His
65 70 75 80

Gly Gln Asp Gly Thr Thr Val Ala Leu Ala Ala His Val Glu His Arg
85 90 95

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

Arg Arg His Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn Arg
115 120 125

Thr Arg Pro Lys Gly Trp Leu Pro Pro Ser Leu Val Ser Lys Ala Glu
130 135 140

Asn Ile Leu Asn Trp Val Ile Arg Phe Thr Lys Leu Ala Pro Phe Thr
145 150 155 160

Lys Phe Ala Leu Glu Thr Ala Lys Phe Asp Met Gln Lys Leu Glu Asn
165 170 175

Pro Asp Thr Gln Gly Val Gly Tyr Gln Gln Gly Arg Met Phe Gly Tyr
180 185 190

Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu Asn Tyr Thr Cys Ile
195 200 205

Tyr Cys Gly Ile His Ala Ser Lys Ala Lys Met Glu Ile Glu His Val
210 215 220

Ile Pro Arg Ser Arg Gly Gly Thr Asp Ser Leu Asn Asn Leu Val Leu
225 230 235 240

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

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

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

Tyr Cys Gln Gln Ile His Leu Met Asp Gly Tyr Ser Tyr Ala
435 440 445

<210> 97
<211> 446
<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-73 effector

<400> 97

Met Phe Lys Gln Pro Asn Phe Asn Lys Val Leu Val Leu Asp Thr Asn
1 5 10 15

Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala Arg Ala Lys Lys Leu Leu

20 25 30

Asn Ser Gly Arg Ala Ser Val Phe Arg Arg Tyr Pro Phe Thr Ile Ile
35 40 45

Leu His Asp Arg Thr Val Glu Glu Ser Val Leu Gln Glu Val Glu Val
50 55 60

Lys Ile Asp Gln Gly Ser Lys Thr Thr Gly Val Ala Leu Leu Val His
65 70 75 80

Gly Gln Asp Gly Ala Thr Val Ala Phe Ala Ala His Ile Glu His Arg

85 90 95

Thr Asn Val Lys Ser Gly Leu Asp Ser Arg Arg Ala Ile Arg Arg Ser
100 105 110

Arg Arg Asn Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn Arg
115 120 125

Thr Arg Pro Lys Gly Trp Leu Pro Pro Ser Leu Val Ser Lys Ala Glu
130 135 140

Asn Ile Leu Asn Trp Val Ile Arg Phe Ile Lys Leu Thr Pro Phe Thr

145 150 155 160

Lys Phe Ala Leu Glu Thr Ala Lys Phe Asp Met Gln Lys Leu Glu Asn

165 170 175

Pro Asp Thr Gln Gly Val Gly Tyr Gln Gln Gly Arg Met Phe Gly Tyr
180 185 190

Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu Asn Tyr Thr Cys Ile
195 200 205

Tyr Cys Gly Ile His Ala Ser Lys Ala Lys Met Glu Ile Glu His Val

210 215 220

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

275 280 285

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

340 345 350

Val Gly Arg Gly Ser Arg Gln Phe Cys Arg Met Asp Lys Tyr Gly Phe
355 360 365
Pro Arg Thr Ser Pro Lys Pro Arg Ser Lys Asn Phe Phe Gly Phe Lys
370 375 380
Thr Gly Asp Met Val Lys Val Ile Val Pro Thr Gly Ala Lys Thr Lys
385 390 395 400
Val Pro Thr Gly Thr Tyr Thr Gly Arg Val Ala Val Arg Ser Lys Gly

405 410 415

Ser Phe Asp Val Lys Thr Arg Asp Thr Lys Leu Thr Val Ser His Lys
420 425 430
Cys Cys Lys Gln Ile His Leu Met Asp Gly Tyr Ser Tyr Ala
435 440 445

<210> 98

<211> 360

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-74 effector

<400> 98

Met Phe Lys Gln Pro Asn Phe Asn Lys Val Leu Val Leu Asp Thr Asn
1 5 10 15

Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala Arg Ala Lys Lys Leu Leu
20 25 30

Asn Ser Gly Arg Ala Ser Val Phe Arg Arg Tyr Pro Phe Thr Ile Ile
35 40 45

Leu His Asp Arg Thr Val Glu Glu Ser Val Leu Gln Glu Val Glu Val
50 55 60

Lys Ile Asp Gln Gly Ser Lys Thr Thr Gly Val Ala Leu Leu Val His
65 70 75 80

Gly Gln Asp Gly Ala Thr Val Ala Phe Ala Ala His Ile Glu His Arg
85 90 95

Thr Asn Val Lys Ser Gly Leu Asp Ser Arg Arg Ala Ile Arg Arg Ser
100 105 110

Arg Arg Asn Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn Arg
115 120 125

Thr Arg Pro Lys Gly Trp Leu Pro Pro Ser Leu Val Ser Lys Ala Glu
130 135 140

Asn Ile Leu Asn Trp Val Ile Arg Phe Thr Lys Leu Thr Pro Phe Thr
145 150 155 160

Lys Phe Ala Leu Glu Thr Ala Lys Phe Asp Met Gln Lys Leu Glu Asn
165 170 175

Pro Asp Thr Gln Gly Val Gly Tyr Gln Gln Gly Arg Met Phe Gly Tyr

180 185 190

Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu Asn Tyr Thr Cys Ile
195 200 205

Tyr Cys Gly Ile His Ala Ser Lys Ala Lys Met Glu Ile Glu His Val
210 215 220

Ile Pro Arg Ser Arg Gly Gly Thr Asp Ser Leu Asn Asn Leu Val Leu
225 230 235 240

Ser Cys Arg Ala Cys Asn Glu Ala Lys Gly Ser Gln Asp Val Gln Thr
245 250 255

Tyr Leu Lys Gly Asn Pro Ser Val Leu Arg Arg Val Lys Ala Arg Leu
260 265 270

Asn Thr Asn Tyr Arg Asp Ala Ala His Thr Asn Ser Ile Arg Leu Tyr
275 280 285

Val Met Asn Lys Leu Arg Ala Met Ala Glu Ala Ile Gly Ala Lys Leu
290 295 300

Val Val Gly Phe Gly Ser Thr Thr Lys Glu Asn Arg Leu Leu Leu Asn
305 310 315 320

Leu Pro Lys Asp His Trp Ile Asp Ala Ala Val Cys Thr Lys Asp Gly
325 330 335

Ala Ser Val Arg Val Glu Pro Ala Leu Lys Pro Leu Val Ile Lys Ala
340 345 350

Val Gly Arg Gly Ser Arg Gln Phe
355 360

<210> 99

<211> 446

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-75 effector

<400> 99

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

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

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

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

245 250 255

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

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

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

<210> 100
<211> 160
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-76 effector

<400> 100

Met Gly Tyr His Asp Tyr Pro Ile Leu Thr Gly Ile Leu Phe Ile Arg
1 5 10 15

Glu Ser Leu Thr Leu Ala Cys His Asp Cys Asn Gln Lys Lys Gly Asn
20 25 30

Gln Asp Val Arg Glu Phe Leu Ala Thr Lys Pro Asp Leu Leu Asn Arg

35 40 45

Ile Leu Gln Gln Ala Lys Leu Pro Leu Lys Asp Ala Ala Ala Val Asn
50 55 60

Ser Thr Arg Trp Ala Leu Phe Arg Ala Leu Lys Glu Thr Gly Leu Pro
65 70 75 80

Val Thr Asp Gly Thr Gly Gly Gln Thr Lys Phe Asn Arg Asn Arg Leu
85 90 95

Gly Leu Pro Lys Ser His Trp Leu Asp Ala Ala Cys Val Gly Asn Val

100 105 110

Glu Thr Leu Lys Val Leu Thr Ser Lys Pro Leu Leu Ile Ala Ala Thr
115 120 125

Gly His Gly Arg Arg Gln Met Cys Gly Thr Asn Lys Tyr Gly Phe Pro
130 135 140

Thr Arg His Lys Ser Arg Val Gln Ile His Lys Gly Phe Leu Ala Trp
145 150 155 160

<210> 101

<211> 198

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-77 effector

<400> 101

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

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

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

Tyr Lys Lys Pro Ile Val Cys His His Ile Arg Asn Lys Glu Ala Arg
180 185 190
Phe Asn Asn Arg Ser Arg
195

<210> 102
<211> 253
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-78 effector

<400> 102

Met Asn Arg Val Phe Val Leu Asp Thr Gln Arg Arg Pro Leu Asp Pro
1 5 10 15

Val His Pro Gly Lys Ala Arg Leu Leu Leu Asn Gln Gly Lys Ala Ala
20 25 30

Val Tyr Arg Arg Tyr Pro Phe Thr Ile Ile Leu Lys Glu Ala His Pro
35 40 45

Asp Val Pro Val Gln Asp Leu Glu Leu Lys Leu Asp Pro Gly Ser Lys
50 55 60

Val Thr Gly Ile Ala Ile Lys Gln Gly Asn Lys Ile Ile Phe Gly Ala
65 70 75 80

Glu Leu Arg His Arg Gly Gln Gln Ile Arg Asp Ala Leu Leu Ser Arg
85 90 95

Arg Gln Leu Arg His Gly Arg Arg Asn Arg Lys Thr Arg Tyr Arg Gln
100 105 110

Pro Arg Phe Leu Asn Arg Lys Arg Pro Asp Gly Trp Leu Ala Pro Ser
115 120 125

Leu Lys His Arg Val Asp Thr Val Leu Thr Trp Val Asn Arg Phe Arg
130 135 140

Lys Leu Ala Pro Leu Gly Ser Ile Ala Gln Glu Leu Val Arg Phe Asp
145 150 155 160

Leu Gln Lys Leu Gln Asn Pro Glu Val Ser Gly Ile Glu Tyr Gln Gln
165 170 175

Gly Glu Leu Gln Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys Trp
180 185 190

Gly Arg Lys Cys Ala Tyr Cys Gly Ala Lys Asp Val Pro Leu Glu Val
195 200 205

Glu His Ile His Pro Arg Ser Lys Gly Gly Thr Asp Arg Val Ser Asn
210 215 220

Leu Ala Ile Ala Cys His Ala Cys Asn Gln Arg Lys Gly Asn Arg Asp
225 230 235 240
Ile Arg Asp Phe Leu Phe Gly Lys Pro Glu Leu Leu Gln
245 250

<210> 103
<211> 216
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors

<220><223> Description: MG35-79 effector
<400> 103
Met Pro Cys His Pro Ala Arg Ala Arg Lys Leu Leu Lys Lys Gly Lys
1 5 10 15
Ala Ala Val Tyr Arg Arg Tyr Pro Phe Thr Ile Ile Leu Lys Glu Arg
20 25 30
Val Asp Gly Gln Leu Gln Pro Val Glu Ile Lys Phe Asp Pro Gly Ser
35 40 45
Arg Thr Thr Gly Ile Ala Leu Val Gly His Phe Glu Arg Gly Ser Glu

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

115 120 125
Ala Leu Lys Leu Ser Arg Leu Ala Pro Ile Thr Gln Ile Ala Val Glu
130 135 140
Thr Val Arg Phe Asp Thr Gln Lys Met Gln Asn Pro Glu Val Ser Gly

145 150 155 160

Met Glu Tyr Gln Gln Gly Glu Leu Ala Gly Tyr Glu Phe Arg Glu Tyr

165 170 175

Leu Leu Glu Lys Trp Gly Arg Gln Cys Ala Tyr Cys Gly Val Gln Asn

180 185 190

Val Pro Leu Glu Val Asp Val Leu Met Glu Asp Val Glu Leu Glu Glu

195 200 205

Leu Leu His Gln Phe Arg Tyr Arg

210 215

<210> 104

<211> 274

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-80 effector

<400> 104

Met Pro Cys His Pro Ala Arg Ala Arg Lys Leu Leu Lys Lys Arg Lys

1 5 10 15

Ala Ala Val Leu Arg Arg Tyr Pro Phe Thr Ile Ile Leu Lys His Arg

20 25 30

Val Gly Gly Asp Leu Gln Pro Val Glu Ile Lys Phe Asp Pro Gly Ser

35 40 45

Arg Thr Thr Gly Ile Ala Leu Val Gly His Phe Asp Arg Gly Ser Glu

50 55 60

Val Ile Trp Ala Gly Asn Leu Asn His Arg Gly Leu Gln Ile Lys Ser

65 70 75 80

Asn Leu Asp Ser Arg Arg Ser Ile Arg Arg Ser Arg Arg Asn Arg Lys

85 90 95

Thr Arg Tyr Arg Pro Ala Arg Phe Leu Asn Arg Arg Arg Pro Lys Gly

100 105 110

Trp Leu Pro Pro Ser Leu Trp Ser Arg Val Asp Asn Val Lys Asn Leu
115 120 125
Met Leu Lys Leu Ser Arg Leu Ala Pro Ile Thr Gln Ile Ala Val Glu

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

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

260 265 270
Gly Leu

<210> 105
<211> 430
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-81 effector
<400> 105
Met Pro Cys His Pro Ala Arg Ala Arg Lys Leu Leu Lys Lys Arg Lys

1 5 10 15

Ala Ala Val Leu Arg Arg Tyr Pro Phe Thr Ile Ile Leu Lys His Arg

20 25 30

Val Gly Gly Asp Leu Gln Pro Val Glu Ile Lys Phe Asp Pro Gly Ser

35 40 45

Arg Thr Thr Gly Ile Ala Leu Val Gly His Phe Asp Arg Gly Ser Glu

50 55 60

Val Ile Trp Ala Gly Asn Leu Asn His Arg Gly Leu Gln Ile Lys Ser

65 70 75 80

Asn Leu Asp Ser Arg Arg Ser Ile Arg Arg Ser Arg Arg Asn Arg Lys

85 90 95

Thr Arg Tyr Arg Pro Ala Arg Phe Leu Asn Arg Arg Arg Pro Lys Gly

100 105 110

Trp Leu Pro Pro Ser Leu Trp Ser Arg Val Asp Asn Val Lys Asn Leu

115 120 125

Met Leu Lys Leu Ser Arg Leu Ala Pro Ile Thr Gln Ile Ala Val Glu

130 135 140

Thr Val Arg Phe Asp Thr Gln Gln Met Gln Asn Pro Glu Ile Ser Gly

145 150 155 160

Val Glu Tyr Gln Gln Gly Glu Leu Ala Gly Tyr Glu Leu Arg Glu Tyr

165 170 175

Leu Leu Glu Lys Trp Gly Arg Gln Cys Ala Tyr Cys Gly Ala Lys Asn

180 185 190

Val Pro Leu Glu Val Glu His Ile Gln Ala Arg Ser Gln Gly Gly Thr

195 200 205

Asp Arg Val Ser Asn Leu Thr Leu Ala Cys Thr Ser Cys Asn Leu Gln

210 215 220

Lys Gly Asn Lys Asp Ile Lys Glu Phe Leu Lys His Lys Pro Lys Arg

225 230 235 240

Leu Lys Thr Ile Gln Thr Phe Ala Lys Ala Pro Leu Lys Asp Ala Ala

245 250 255

Ala Met Asn Ala Thr Arg Asn Ala Ile Gly Asn Val Leu Lys Gly Phe
260 265 270
Gly Leu Pro Ile Thr Ile Ser Ser Gly Gly Arg Thr Lys Phe Asn Arg
275 280 285

Thr Gln Gln Gly Tyr Pro Lys Asp His Trp Ile Asp Ala Ala Cys Val
290 295 300
Gly Glu Ser Gly Asn Asn Val Ile Ile Pro Lys Ala Ile Thr Pro Leu
305 310 315 320
Ile Ile Thr Ala Lys Gly Arg Gly Ser Arg Gln Lys Cys Ser Met Asn
325 330 335
Gln Tyr Gly Phe Pro Arg Thr Gly Pro Lys Lys Lys Lys Arg Val Lys
340 345 350

Gly Phe Gln Thr Gly Asp Ile Val Lys Ala Ile Val Thr Ser Gly Lys
355 360 365
Lys Ile Gly Thr Tyr Val Gly Arg Val Met Val Arg Lys Thr Gly Cys
370 375 380
Phe Asp Ile Tyr Thr Gly Phe Gly Arg Ile Ser Ser Leu Ser Tyr Arg
385 390 395 400
Phe Cys Arg Leu Ile Gln Arg Thr Asp Gly Tyr Glu Tyr Ser Thr Asp
405 410 415

Leu Cys Pro Ile Lys Lys Gly Ser Gly Lys Tyr Phe Asn Ser
420 425 430

<210> 106
<211> 413
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-82 effector
<400> 106
Met Pro Cys His Pro Ala Arg Ala Arg Lys Leu Leu Lys Asn Gly Lys

1 5 10 15

Ala Ala Val Tyr Arg Arg Tyr Pro Phe Thr Ile Ile Met Lys Cys Arg

20 25 30

Val Gly Gly Asp Leu Gln Pro Ile Glu Ile Lys Phe Asp Pro Gly Ser

35 40 45

Arg Thr Thr Gly Ile Ala Leu Val Gly His Phe Asp Arg Gly Ser Glu

50 55 60

Val Ile Trp Ala Gly Asn Leu Asn His Arg Gly Leu Gln Ile Lys Arg

65 70 75 80

Asn Leu Asp Ser Arg Arg Ala Val Arg Arg Ser Arg Arg Asn Arg Lys

85 90 95

Thr Arg Tyr Arg Pro Ala Arg Phe Leu Asn Arg Arg Arg Pro Arg Gly

100 105 110

Trp Leu Pro Pro Ser Leu Arg Ser Arg Val Asp Asn Val Lys Asn Trp

115 120 125

Met Ile Lys Leu Ser Arg Leu Ala Pro Leu Thr Gln Ile Ala Val Glu

130 135 140

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

145 150 155 160

Val Glu Tyr Gln Gln Gly Glu Leu Ala Gly Tyr Glu Leu Arg Glu Tyr

165 170 175

Leu Leu Glu Lys Trp Gly Arg Glu Cys Ala Tyr Cys Gly Ala Lys Asn

180 185 190

Val Pro Leu Glu Ile Glu His Ile Gln Ala Cys Ser Lys Gly Gly Ser

195 200 205

Asp Arg Val Ser Asn Leu Thr Leu Ala Cys Thr Pro Cys Asn Ile Asp

210 215 220

Lys Gly Asn Lys Asp Ile Lys Glu Phe Met Lys Arg Lys Thr Glu Arg

225 230 235 240

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

245 250 255

Ala Val Asn Ala Thr Arg Tyr Ala Thr Gly Asn Ala Leu Lys Gly Leu
260 265 270
Gly Leu Pro Ile Thr Phe Ser Ser Gly Gly Arg Thr Lys Phe Asn Arg

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

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

405 410
<210> 107
<211> 136
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-83 effector
<400> 107
Met Pro Val Lys Pro Phe Glu Leu Lys Gln Phe Arg Arg His Asp Arg
1 5 10 15
Gln Ala Cys Ile Arg Gln Met Val Asp Arg Lys Tyr Leu Leu Asp Gly

20 25 30

Lys Val Val Ala Thr Asn Arg His Lys Ser Ile Glu Gln Lys Ser Asp
35 40 45
Ser Leu Glu Glu Phe Arg Glu Ala Tyr Gly Asp Ala Ala Val Ser Gln
50 55 60
Leu Thr Val Arg Leu His Ser Pro Gln Tyr Lys Asp Met Ala Arg Ile
65 70 75 80
Met Pro Gly Ala Val Met Ala Phe Lys Gly Thr Ile Gly Val Met Gln
85 90 95

Cys Ser Gly Gly Arg Asn Asn Gly Lys Val Glu Phe Phe Lys Ser Thr
100 105 110
Lys Gly Asn Lys Thr Thr Pro Lys Lys Cys Val Leu Leu Ala Gln Asn
115 120 125
Ala Gly Met Val Phe Ile Pro Ala
130 135

<210> 108
<211> 113
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-84 effector

<400> 108
Met Gln Leu Gly Asp Arg Ser Ser His Val Val Ile Pro Gln Thr Ile
1 5 10 15
Thr Pro Leu Ile Ile Thr Ala Lys Gly Arg Gly Ser Arg Gln Lys Cys
20 25 30
Ser Met Asn Gln Tyr Gly Phe Pro Arg Thr Ser Pro Lys Lys Tyr Lys
35 40 45
Arg Val Lys Gly Phe Gln Ser Gly Asp Ile Val Lys Ala Ile Val Thr

50 55 60

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

<210> 109
<211> 423
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors
<220><223> Description: MG35-85 effector
<400> 109
Met Gln Asn Tyr Thr Phe Val Leu Asp Thr Asn Lys Gln Pro Leu Phe
1 5 10 15
Pro Val His Pro Ala Val Ala Arg Lys Met Leu Ser Asn Ala Glu Ala
20 25 30
Ala Val Phe Arg Arg Tyr Pro Phe Thr Ile Ile Leu Lys His Gly Ala
35 40 45
Asp Arg Pro Thr Gln Ser Ile Glu Ile Lys Leu Asp Pro Gly Ser Lys

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

Ala Arg Phe Leu Asn Arg Thr Arg Ser Lys Gly Trp Leu Thr Pro Ser

115 120 125

Leu Lys His Arg Val Cys Thr Thr Leu Thr Trp Val Asn Lys Phe Ile

130 135 140

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

145 150 155 160

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

165 170 175

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

180 185 190

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

195 200 205

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

210 215 220

Leu Cys Leu Ala Cys Glu Lys Cys Asn Leu Lys Lys Gly Thr Gln Asp

225 230 235 240

Ile Lys Asp Phe Leu Ser Lys Lys Thr Asp Leu Leu Lys Gln Ile Met

245 250 255

Ala Gln Ala Lys Arg Pro Leu Lys Asp Ala Ser Ala Val Asn Ser Thr

260 265 270

Arg Trp Ala Leu Phe Asn Gln Leu Lys Leu Thr Gly Leu Pro Val Thr

275 280 285

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

290 295 300

Pro Lys Thr His Tyr Phe Asp Ala Ala Cys Val Gly Lys Val Asp Lys

305 310 315 320

Leu Val Val Leu Thr Thr Gln Pro Leu Leu Ile Lys Ala Asn Gly His

325 330 335

Gly Thr Arg Gln Met Cys Arg Thr Asp Lys Phe Gly Phe Pro Ser Arg

340 345 350

His Ala Pro Arg Asn Lys Phe Val Lys Gly Phe Gln Thr Gly Asp Ile

355 360 365

Val Lys Ala Ile Val Thr Ser Gly Lys Lys Ile Gly Glu Tyr Val Gly

370 375 380

Arg Ala Ala Val Arg Ser Ser Gly Ser Phe Asn Ile Ser Ala Lys Glu

385 390 395 400

Leu Val Gln Gly Ile Gly His Lys Tyr Cys Glu Ile Leu His Arg Lys

405 410 415

Asp Gly Tyr Ser Tyr Gln Phe

420

<210> 110

<211> 428

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<

220><223> Category: MG35 effectors

<220><223> Description: MG35-86 effector

<400> 110

Met Gln Arg Ile Phe Val Leu Asp His Asn Lys Gln Pro Leu Met Pro

1 5 10 15

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

20 25 30

Val Tyr Arg Arg Tyr Pro Phe Thr Ile Ile Met Thr Tyr Arg Val Gly

35 40 45

Gly Asp Leu Gln Pro Ile Glu Ile Lys Phe Asp Pro Gly Ser Arg Thr

50 55 60

Thr Gly Ile Ala Leu Val Gly His Phe Asp Arg Gly Thr Glu Val Ile

65 70 75 80

Trp Ala Gly Asn Leu Asn His Arg Gly Leu Gln Val Lys Asn Asn Leu

85 90 95

Asn Ser Arg Arg Ser Ile Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg

100 105 110

Tyr Arg Pro Ala Arg Phe Leu Asn Arg Arg Arg Pro Gln Gly Trp Leu

115 120 125

Pro Pro Ser Leu Arg Ser Arg Val Asp Asn Val Ser Ile Trp Met Ile

130 135 140

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

145 150 155 160

Arg Phe Asp Thr Gln Lys Met Gln Lys Pro Glu Ile Ser Gly Val Glu

165 170 175

Tyr Gln Gln Gly Glu Leu Ala Gly Tyr Glu Leu Arg Glu Tyr Leu Leu

180 185 190

Glu Lys Trp Gly Arg Glu Cys Ala Tyr Cys Gly Ala Lys Asn Val Pro

195 200 205

Phe Glu Ile Glu His Ile Gln Ala Arg Ser Lys Gly Gly Ser Asp Arg

210 215 220

Val Ser Asn Leu Thr Leu Ala Cys Thr Pro Cys Asn Ile Asp Lys Gly

225 230 235 240

Asn Lys Asp Ile Lys Glu Phe Met Lys Arg Lys Pro Lys Arg Leu Lys

245 250 255

Lys Ile Gln Ala Gln Ser Lys Ala Pro Leu Lys Asp Ala Ala Ala Val

260 265 270

Asn Ala Thr Arg Tyr Val Ile Gly Asn Ala Leu Lys Ser Phe Gly Leu

275 280 285

Pro Ile Thr Phe Ser Ser Gly Gly Arg Thr Lys Phe Asn Arg Ile Lys

290 295 300

Gln Gly Tyr Lys Lys Asp His Trp Ile Asp Ala Ala Cys Val Ser Glu

305 310 315 320

Ser Gly Gly His Val Val Ile Pro Gln Ala Ile Thr Pro Leu Ile Ile

325 330 335

Thr Ala Lys Gly Arg Gly Ser Arg Gln Lys Cys Ser Met Asn Gln Tyr

340 345 350

Gly Phe Pro Arg Thr Gly Pro Lys Lys Tyr Lys Arg Val Lys Gly Phe

355 360 365

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

370 375 380

Gly Thr Tyr Val Gly Arg Val Ala Val Arg Ala Ser Gly Ser Phe Asp

385 390 395 400

Ile Gly Ser Gly Glu Glu Arg Val Gly Ser Ile Ser Tyr Lys Tyr Cys

405 410 415

Arg Leu Leu Gln Lys Ser Asp Gly Tyr Glu Tyr Thr

420 425

<210> 111

<211> 414

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-87 effector

<400> 111

Met Gln Arg Val Phe Ile Leu Asp His Asn Lys Lys Pro Leu Met Pro

1 5 10 15

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

20 25 30

Val Tyr Arg Arg Tyr Pro Phe Ile Ile Ile Met Lys Cys Arg Val Gly

35 40 45

Gly Asp Leu Gln Pro Ile Glu Ile Lys Phe Asp Pro Gly Ser Arg Thr

50 55 60

Thr Gly Ile Ala Leu Val Gly His Phe Asp Arg Gly Pro Glu Val Ile

65 70 75 80

Trp Ala Gly Asn Leu Asn His Arg Gly His Gln Ile Lys Arg Asn Leu

85 90 95

Asp Ser Arg Arg Ala Val Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg

100 105 110

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

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

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

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

Gly Phe Pro Arg Thr Ser Pro Lys Lys His Lys Arg Val Lys Gly Phe
355 360 365

Gln Thr Gly Asp Ile Val Lys Ala Val Val Thr Lys Gly Lys Asn Ile
370 375 380
Gly Thr Tyr Ile Gly Arg Val Val Val Arg Ala Arg Gly Ser Phe Asp
385 390 395 400
Ile Gly Ile Gly Lys Lys Lys Val Ser Gly Ile Ser Tyr Lys
405 410

<210> 112
<211> 427
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors

<220><223> Description: MG35-88 effector
<400> 112
Met Gln Arg Val Phe Ile Leu Asp His Asn Lys Lys Pro Leu Met Pro
1 5 10 15
Cys His Pro Ala Arg Ala Arg Lys Leu Leu Lys Asn Gly Lys Ala Ala
20 25 30
Val Tyr Arg Arg Tyr Pro Phe Ile Ile Ile Met Lys Cys Arg Val Gly
35 40 45
Gly Asp Leu Gln Pro Ile Glu Ile Lys Phe Asp Pro Gly Ser Arg Thr

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

Tyr Arg Pro Ala Arg Phe Asn Asn Arg Gln Arg Pro Lys Ser Trp Leu

115 120 125

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

130 135 140

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

145 150 155 160

Arg Phe Asp Thr Gln Lys Ile Gln Asn Pro Glu Ile Ser Gly Val Glu

165 170 175

Tyr Gln Gln Gly Glu Leu Ala Gly Tyr Glu Leu Arg Glu Tyr Leu Leu

180 185 190

Glu Lys Trp Asp Arg Glu Cys Ala Tyr Cys Gly Ala Lys Asn Val Pro

195 200 205

Leu Glu Ile Glu His Ile Gln Ala Arg Ser Lys Gly Gly Ser Asp Arg

210 215 220

Val Ser Asn Leu Thr Leu Ala Cys Thr Pro Cys Asn Gln Lys Lys Gly

225 230 235 240

Asn Lys Asp Ile Lys Glu Phe Leu Lys Arg Lys Pro Lys Arg Leu Lys

245 250 255

Lys Ile Gln Ala Gln Ala Lys Val Pro Leu Lys Asp Ala Ala Ala Val

260 265 270

Asn Ala Thr Arg Tyr Ala Thr Gly Asn Val Leu Lys Asp Phe Gly Leu

275 280 285

Pro Ile Thr Phe Ser Thr Gly Gly Arg Thr Lys Phe Asn Arg Thr Thr

290 295 300

Arg Gly Tyr Pro Lys Ala His Trp Ile Asp Ala Ala Cys Val Gly Glu

305 310 315 320

Ser Gly Ala Lys Val Val Ile Pro Pro Ala Ile Thr Pro Leu Ile Ile

325 330 335

Thr Ala Lys Gly Arg Gly Ser Arg Gln Lys Cys Ser Met Asn Gln Tyr

340 345 350

Gly Phe Pro Arg Thr Ser Pro Lys Lys His Lys Arg Val Lys Gly Phe

355 360 365

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

370 375 380

Gly Thr Tyr Ile Gly Arg Val Val Val Arg Ala Arg Gly Ser Phe Asp

385 390 395 400

Ile Gly Ile Gly Lys Lys Lys Val Ser Gly Ile Ser Tyr Lys Tyr Cys

405 410 415

Gln Leu Ile Gln Arg Val Asp Gly Tyr Glu Tyr

420 425

<210> 113

<211> 428

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-89 effector

<400> 113

Met Gln Arg Val Phe Ile Leu Asp His Asn Lys Lys Pro Leu Met Pro

1 5 10 15

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

20 25 30

Val Tyr Arg Arg Tyr Pro Phe Ile Ile Ile Met Lys Cys Arg Val Gly

35 40 45

Gly Asp Leu Gln Pro Ile Glu Ile Lys Phe Asp Pro Gly Ser Arg Thr

50 55 60

Thr Gly Ile Ala Leu Val Gly His Phe Asp Arg Gly Pro Glu Val Ile

65 70 75 80

Trp Ala Gly Asn Leu Asn His Arg Gly His Gln Ile Lys Arg Asn Leu

85 90 95

Asp Ser Arg Arg Ala Val Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg

100 105 110

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

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

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

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

Gly Phe Pro Arg Thr Ser Pro Lys Lys His Lys Arg Val Lys Gly Phe
355 360 365

Gln Thr Gly Asp Ile Val Lys Ala Val Val Thr Lys Gly Lys Asn Ile
370 375 380
Gly Thr Tyr Ile Gly Arg Val Val Val Arg Ala Arg Gly Ser Phe Asp
385 390 395 400
Ile Gly Ile Gly Lys Lys Lys Val Ser Gly Ile Ser Tyr Lys Tyr Cys
405 410 415
Gln Leu Ile Gln Arg Val Asp Gly Tyr Glu Tyr Thr
420 425
<210> 114
<211
> 428
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-90 effector
<400> 114
Met Gln Arg Val Phe Val Leu Asp His Asn Lys Gln Pro Leu Met Pro
1 5 10 15
Cys His Pro Ala Arg Ala Arg Lys Leu Leu Lys Lys Gly Lys Ala Ala
20 25 30
Val Tyr Arg Arg Tyr Pro Phe Ala Ile Ile Met Thr His Arg Val Gly

35 40 45
Gly Asp Leu Gln Thr Val Glu Ile Lys Phe Asp Pro Gly Ser Arg Thr
50 55 60
Thr Gly Ile Ala Leu Val Gly Asp Phe Asp Arg Gly Lys Glu Val Ile
65 70 75 80
Trp Ala Gly Asn Leu Asn His Arg Gly His Gln Ile Lys Ser Asn Leu
85 90 95

Asn Ser Arg Arg Ala Ile Arg Arg Ala Arg Arg Asn Arg Lys Thr Arg

100 105 110

Tyr Arg Gln Ala Arg Phe Asn Asn Arg Arg Arg Pro Lys Gly Trp Leu

115 120 125

Pro Pro Ser Leu Arg Ser Arg Val Asp Asn Thr Lys Asn Trp Met His

130 135 140

Lys Leu Ala Arg Leu Ala Pro Leu Thr Gln Ile Ala Val Glu Thr Val

145 150 155 160

Arg Phe Asp Thr Gln Lys Leu Gln Lys Pro Glu Ile Ser Gly Val Glu

165 170 175

Tyr Gln Gln Gly Glu Leu Ala Gly Tyr Glu Leu Arg Glu Tyr Leu Leu

180 185 190

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

195 200 205

Leu Glu Ile Glu His Ile Gln Ala Arg Ser Lys Gly Gly Ser Asp Arg

210 215 220

Val Ser Asn Leu Thr Leu Ala Cys Thr Pro Cys Asn Ile Asp Lys Gly

225 230 235 240

Asn Lys Asp Ile Lys Glu Phe Leu Ser Leu Lys Pro Lys Arg Leu Lys

245 250 255

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

260 265 270

Asn Ala Thr Arg Tyr Ala Thr Gly Asn Val Leu Lys Cys Phe Ser Leu

275 280 285

Pro Ile Thr Phe Ser Ser Gly Gly Arg Thr Lys Phe Asn Arg Val Lys

290 295 300

Leu Gly Tyr Leu Lys Asp His Trp Ile Asp Ala Ala Cys Val Gly Glu

305 310 315 320

Ser Gly Ser Gln Val Val Ile Pro Lys Ala Ile Thr Pro Leu Ile Ile

325 330 335

Thr Ser Lys Gly Arg Gly Ser Arg Gln Lys Cys Arg Met Asn Gln Tyr

340 345 350

Gly Phe Pro Arg Thr Gly Pro Lys Lys Gln Lys Gln Val Lys Gly Phe

355 360 365

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

370 375 380

Gly Thr Tyr Ile Gly Arg Val Val Val Arg Ser Arg Gly Ser Phe Asp

385 390 395 400

Ile Gly Ser Gly Glu Lys Lys Val Gly Ser Ile Ser Tyr Lys Tyr Cys

405 410 415

Gln Leu Leu Gln Arg Ala Asp Gly Tyr Glu Tyr Thr

420 425

<210> 115

<211> 428

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-91 effector

<400> 115

Met Gln Arg Val Phe Val Leu Asp His Asn Lys Gln Pro Leu Met Pro

1 5 10 15

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

20 25 30

Val Tyr Arg Arg Tyr Pro Phe Thr Ile Ile Met Thr His Arg Leu Cys

35 40 45

Gly Asp Leu Gln Pro Ile Glu Ile Lys Phe Asp Leu Gly Ser Arg Thr

50 55 60

Thr Gly Ile Ala Leu Val Gly His Phe Asp Arg Gly Ser Glu Val Ile

65 70 75 80

Trp Ala Gly Asn Leu Asn His Arg Gly Tyr Gln Ile Lys Lys Asp Leu

85 90 95

Asn Ser Arg Arg Ala Ile Arg Arg Thr Arg Arg Asn Arg Lys Thr Arg
100 105 110
Tyr Arg Pro Ala Arg Phe Leu Asn Arg Arg Arg Pro Thr Gly Trp Leu
115 120 125
Pro Pro Ser Leu Arg Ser Arg Val Leu Asn Val Asn Asn Trp Met Leu
130 135 140
Lys Leu Ser Gln Leu Ala Pro Leu Thr Gln Ile Ala Val Glu Thr Val
145 150 155 160

Arg Phe Asp Thr Gln Lys Ile Gln Lys Pro Glu Ile Ser Gly Val Glu
165 170 175
Tyr Gln Gln Gly Glu Leu Ala Gly Tyr Glu Leu Arg Glu Tyr Leu Leu
180 185 190
Glu Lys Trp Gly Arg Glu Cys Val Tyr Cys Gly Ala Lys Asn Val Pro
195 200 205
Leu Glu Ile Glu His Ile Gln Ala Arg Ser Lys Gly Gly Ser Asp Arg
210 215 220

Val Ser Asn Leu Thr Leu Ala Cys Thr Pro Cys Asn Ile Asp Lys Gly
225 230 235 240
Asn Lys Asp Ile Lys Glu Phe Leu Lys Arg Lys Pro Lys Arg Leu Lys
245 250 255
Lys Ile Gln Thr Ile Ala Thr Ala Ser Leu Lys Asp Ala Ala Ala Ile
260 265 270
Asn Ala Thr Arg Tyr Ala Thr Gly Asn Ala Leu Lys Gly Phe Gly Leu
275 280 285

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

Thr Ala Lys Gly Arg Gly Ser Arg Gln Lys Cys Arg Met Asn Gln Tyr
340 345 350

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

Gln Leu Ile Gln Arg Val Asp Gly Tyr Glu Tyr Thr
420 425

<210> 116
<211> 428
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-92 effector
<400> 116
Met Gln Arg Val Phe Val Leu Asp His Asn Lys Gln Pro Leu Met Pro
1 5 10 15
Cys His Pro Ala Arg Ala Arg Lys Leu Leu Lys Lys Gly Lys Ala Ala
20 25 30

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

85 90 95

Asn Ser Arg Arg Ala Ile Arg Arg Thr Arg Arg Asn Arg Lys Thr Arg
100 105 110
Tyr Arg Pro Ala Arg Phe Leu Asn Arg Arg Arg Pro Thr Gly Trp Leu
115 120 125
Pro Pro Ser Leu Arg Ser Arg Val Leu Asn Val Asn Asn Trp Met Leu
130 135 140
Lys Leu Ser Gln Leu Ala Pro Leu Thr Gln Ile Ala Val Glu Thr Val
145 150 155 160

Arg Phe Asp Thr Gln Lys Ile Gln Lys Pro Glu Ile Ser Gly Val Glu
165 170 175
Tyr Gln Gln Gly Glu Leu Ala Gly Tyr Glu Leu Arg Glu Tyr Leu Leu
180 185 190
Glu Lys Trp Gly Arg Glu Cys Val Tyr Cys Gly Ala Lys Asn Val Pro
195 200 205
Leu Glu Ile Glu His Ile Gln Ala Arg Ser Lys Gly Gly Ser Asp Arg
210 215 220

Val Ser Asn Leu Thr Leu Ala Cys Thr Pro Cys Asn Ile Asp Lys Gly
225 230 235 240
Asn Lys Asp Ile Lys Glu Phe Leu Lys Arg Lys Pro Lys Arg Leu Lys
245 250 255
Lys Ile Gln Thr Ile Ala Thr Ala Ser Leu Lys Asp Ala Ala Ala Ile
260 265 270
Asn Ala Thr Arg Tyr Ala Thr Gly Asn Ala Leu Lys Gly Phe Gly Leu
275 280 285

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

Thr Ala Lys Gly Arg Gly Ser Arg Gln Lys Cys Arg Met Asn Gln Tyr
340 345 350

Gly Phe Pro Arg Thr Arg Pro Lys Lys His Lys Arg Val Lys Gly Phe
355 360 365

Gln Thr Gly Asp Ile Val Lys Ala Val Val Thr Lys Gly Lys Lys Ile
370 375 380

Gly Thr Tyr Val Gly Arg Val Val Val Arg Ala Ser Gly Ser Phe Asp
385 390 395 400

Ile Gly Ile Gly Lys Lys Lys Val Ser Gly Ile Ser Tyr Lys Tyr Cys
405 410 415

Gln Leu Ile Gln Arg Val Asp Gly Tyr Glu Tyr Thr
420 425

<210> 117

<211> 428

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-93 effector

<400> 117

Met Gln Arg Val Phe Val Leu Asp His Asn Lys Gln Pro Leu Met Pro
1 5 10 15

Cys His Pro Ala Arg Ala Arg Lys Leu Leu Lys Lys Gly Lys Ala Ala
20 25 30

Val Tyr Arg Arg Tyr Pro Phe Thr Ile Ile Met Thr His Arg Val Gly
35 40 45

Gly Asp Leu Gln Pro Ile Glu Val Lys Phe Asp Pro Gly Ser Arg Thr
50 55 60

Thr Gly Ile Ala Leu Val Gly His Phe Asn Arg Gly Leu Glu Val Ile
65 70 75 80

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

85 90 95

Glu Ser Arg Arg Ala Ile Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg
100 105 110
Tyr Arg Gln Ala Arg Phe Leu Asn Arg Met Arg Pro Ala Gly Trp Leu
115 120 125
Pro Pro Ser Leu Arg Ser Arg Val Asp Asn Val Lys Asn Gly Met Leu
130 135 140
Lys Leu Ser Ser Leu Thr Pro Val Ser Gln Ile Ala Val Glu Thr Val
145 150 155 160

Lys Phe Asp Met Gln Lys Ile Gln Asn Pro Glu Ile Ser Gly Leu Glu
165 170 175
Tyr Gln His Gly Glu Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu Leu
180 185 190
Glu Lys Trp Gly Arg Lys Cys Ala Tyr Cys Gly Ala Gln Asn Val Pro
195 200 205
Leu Glu Ile Glu His Ile Arg Ala Ser Ser Lys Gly Gly Ser Asn Arg
210 215 220

Val Ser Asn Leu Thr Leu Ala Cys Asn Lys Cys Asn Gln Lys Lys Gly
225 230 235 240
Asn Gln Asp Ile Lys Glu Phe Leu Lys Ser Gln Pro Asp Arg Leu Arg
245 250 255
Lys Ile Gln Ser Gln Ala Leu Lys Pro Leu Lys Asp Ala Ala Ala Val
260 265 270
Asn Ala Thr Arg Tyr Ala Ile Ser Asn Val Leu Lys Ser Phe Gly Leu
275 280 285

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

Thr Ala Lys Gly Arg Gly Ser Arg Gln Lys Cys Ser Met Asn Lys Tyr
340 345 350

Gly Phe Pro Arg Thr Gly Pro Lys Lys Ala Lys Arg Val Lys Gly Phe
355 360 365

Gln Thr Gly Asp Ile Val Lys Ala Val Val Thr Lys Gly Lys Lys Ile
370 375 380

Gly Thr Tyr Phe Gly Arg Val Ala Val Arg Ala Ser Gly Ser Phe Asp
385 390 395 400

Ile Gly Ser Gly Glu Glu Arg Val Gly Ser Ile Ser Tyr Lys Tyr Cys
405 410 415

Cys Leu Leu Gln Arg Ser Asp Gly Tyr Glu Tyr Thr
420 425

<210> 118

<211> 428

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-94 effector

<400> 118

Met Gln Arg Val Phe Val Leu Asp His Asn Lys Gln Pro Leu Met Pro
1 5 10 15

Cys His Pro Ala Arg Ala Arg Lys Leu Leu Lys Lys Gly Lys Ala Ala
20 25 30

Val Tyr Arg Arg Tyr Pro Phe Thr Ile Ile Met Thr His Arg Val Gly
35 40 45

Gly Asp Leu Gln Pro Ile Glu Val Lys Phe Asp Pro Gly Ser Arg Thr
50 55 60

Thr Gly Ile Ala Leu Val Gly His Phe Asn Arg Gly Leu Glu Val Ile
65 70 75 80

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

85 90 95

Glu Ser Arg Arg Ala Ile Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg
100 105 110
Tyr Arg Gln Ala Arg Phe Leu Asn Arg Met Arg Pro Ala Gly Trp Leu
115 120 125
Pro Pro Ser Leu Arg Ser Arg Val Asp Asn Val Lys Asn Gly Met Leu
130 135 140
Lys Leu Ser Ser Leu Thr Pro Val Ser Gln Ile Ala Val Glu Thr Val
145 150 155 160

Lys Phe Asp Met Gln Lys Ile Gln Asn Pro Glu Ile Ser Gly Leu Glu
165 170 175
Tyr Gln His Gly Glu Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu Leu
180 185 190
Glu Lys Trp Gly Arg Lys Cys Ala Tyr Cys Gly Ala Gln Asn Val Ser
195 200 205
Leu Glu Ile Glu His Ile Arg Ala Ser Ser Lys Gly Gly Ser Asn Arg
210 215 220

Val Ser Asn Leu Thr Leu Ala Cys Asn Lys Cys Asn Gln Lys Lys Gly
225 230 235 240
Asn Gln Asp Ile Lys Glu Phe Leu Lys Ser Gln Pro Asp Arg Leu Arg
245 250 255
Lys Ile Gln Ser Gln Ala Leu Lys Pro Leu Lys Asp Ala Ala Ala Val
260 265 270
Asn Ala Thr Arg Tyr Ala Ile Ser Asn Val Leu Lys Ser Phe Gly Leu
275 280 285

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

Thr Ala Lys Gly Arg Gly Ser Arg Gln Lys Cys Ser Met Asn Lys Tyr
340 345 350

Gly Phe Pro Arg Thr Gly Pro Lys Lys Ala Lys Arg Val Lys Gly Phe
355 360 365

Gln Thr Gly Asp Ile Val Lys Ala Val Val Thr Lys Gly Lys Lys Ile
370 375 380

Gly Thr Tyr Phe Gly Arg Val Ala Val Arg Ala Ser Gly Ser Phe Asp
385 390 395 400

Ile Gly Ser Gly Glu Glu Arg Val Gly Ser Ile Ser Tyr Lys Tyr Cys
405 410 415

Cys Leu Leu Gln Arg Ser Asp Gly Tyr Glu Tyr Thr
420 425

<210> 119

<211> 427

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-95 effector

<400> 119

Met Gln Arg Val Phe Val Leu Asp His Asn Lys Gln Pro Leu Met Pro
1 5 10 15

Cys His Pro Ala Arg Ala Arg Lys Leu Leu Lys Asn Gly Lys Ala Ala
20 25 30

Val Tyr Arg Arg Tyr Pro Phe Thr Ile Ile Met Lys Cys Arg Val Gly
35 40 45

Gly Asp Leu Gln Pro Ile Glu Ile Lys Phe Asp Pro Gly Ser Arg Thr
50 55 60

Thr Gly Ile Ala Leu Val Gly His Phe Asp Arg Gly Ser Glu Val Ile
65 70 75 80

Trp Ala Gly Asn Leu Asn His Arg Gly Leu Gln Ile Lys Arg Asn Leu

85 90 95

Asp Ser Arg Arg Ala Val Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg
100 105 110
Tyr Arg Pro Ala Arg Phe Leu Asn Arg Arg Arg Pro Arg Gly Trp Leu
115 120 125
Pro Pro Ser Leu Arg Ser Arg Val Asp Asn Val Lys Asn Trp Met Ile
130 135 140
Lys Leu Ser Arg Leu Ala Pro Leu Thr Gln Ile Ala Val Glu Thr Val
145 150 155 160

Lys Phe Asp Thr Gln Lys Ile Gln Asn Pro Glu Ile Ser Gly Val Glu
165 170 175
Tyr Gln Gln Gly Glu Leu Ala Gly Tyr Glu Leu Arg Glu Tyr Leu Leu
180 185 190
Glu Lys Trp Gly Arg Glu Cys Ala Tyr Cys Gly Ala Lys Asn Val Pro
195 200 205
Leu Glu Ile Glu His Ile Gln Ala Cys Ser Lys Gly Gly Ser Asp Arg
210 215 220

Val Ser Asn Leu Thr Leu Ala Cys Thr Pro Cys Asn Ile Asp Lys Gly
225 230 235 240
Asn Lys Asp Ile Lys Glu Phe Met Lys Arg Lys Thr Glu Arg Leu Lys
245 250 255
Lys Ile Gln Ala Gln Gly Lys Ala Pro Leu Lys Asp Thr Ala Ala Val
260 265 270
Asn Ala Thr Arg Tyr Ala Thr Gly Asn Ala Leu Lys Gly Leu Gly Leu
275 280 285

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

Thr Ala Lys Gly Arg Gly Ser Arg Gln Lys Cys Ser Met Asn Gln Tyr
340 345 350

Gly Phe Pro Arg Thr Gly Pro Lys Lys His Lys Arg Val Lys Gly Phe
355 360 365

Gln Thr Gly Asp Ile Val Lys Ala Val Val Thr Lys Gly Lys Lys Ile
370 375 380

Gly Thr His Ile Gly Arg Val Val Val Arg Ala Arg Gly Ser Phe Asp
385 390 395 400

Ile Gly Ile Gly Lys Lys Lys Val Ser Gly Ile Ser Tyr Lys Tyr Cys
405 410 415

Gln Leu Ile Gln Arg Val Asp Gly Tyr Glu Tyr
420 425

<210> 120

<211> 428

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-96 effector

<400> 120

Met Gln Arg Val Phe Val Leu Asp His Asn Lys Gln Pro Leu Met Pro
1 5 10 15

Cys His Pro Ala Arg Ala Arg Lys Leu Leu Lys Asn Gly Lys Ala Ala
20 25 30

Val Tyr Arg Arg Tyr Pro Phe Thr Ile Ile Met Lys Cys Arg Val Gly
35 40 45

Gly Asp Leu Gln Pro Ile Glu Ile Lys Phe Asp Pro Gly Ser Arg Thr
50 55 60

Thr Gly Ile Ala Leu Val Gly His Phe Asp Arg Gly Ser Glu Val Ile
65 70 75 80

Trp Ala Gly Asn Leu Asn His Arg Gly Leu Gln Ile Lys Arg Asn Leu

85 90 95

Asp Ser Arg Arg Ala Val Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg
100 105 110
Tyr Arg Pro Ala Arg Phe Leu Asn Arg Arg Arg Pro Arg Gly Trp Leu
115 120 125
Pro Pro Ser Leu Arg Ser Arg Val Asp Asn Val Lys Asn Trp Met Ile
130 135 140
Lys Leu Ser Arg Leu Ala Pro Leu Thr Gln Ile Ala Val Glu Thr Val
145 150 155 160

Lys Phe Asp Thr Gln Lys Ile Gln Asn Pro Glu Ile Ser Gly Val Glu
165 170 175
Tyr Gln Gln Gly Glu Leu Ala Gly Tyr Glu Leu Arg Glu Tyr Leu Leu
180 185 190
Glu Lys Trp Gly Arg Glu Cys Ala Tyr Cys Gly Ala Lys Asn Val Pro
195 200 205
Leu Glu Ile Glu His Ile Gln Ala Cys Ser Lys Gly Gly Ser Asp Arg
210 215 220

Val Ser Asn Leu Thr Leu Ala Cys Thr Pro Cys Asn Ile Asp Lys Gly
225 230 235 240
Asn Lys Asp Ile Lys Glu Phe Met Lys Arg Lys Thr Glu Arg Leu Lys
245 250 255
Lys Ile Gln Ala Gln Gly Lys Ala Pro Leu Lys Asp Thr Ala Ala Val
260 265 270
Asn Ala Thr Arg Tyr Ala Thr Gly Asn Ala Leu Lys Gly Leu Gly Leu
275 280 285

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

Thr Ala Lys Gly Arg Gly Ser Arg Gln Lys Cys Ser Met Asn Gln Tyr
340 345 350

Gly Phe Pro Arg Thr Gly Pro Lys Lys His Lys Arg Val Lys Gly Phe
355 360 365

Gln Thr Gly Asp Ile Val Lys Ala Val Val Thr Lys Gly Lys Lys Ile
370 375 380

Gly Thr His Ile Gly Arg Val Val Val Arg Ala Arg Gly Ser Phe Asp
385 390 395 400

Ile Gly Ile Gly Lys Lys Lys Val Ser Gly Ile Ser Tyr Lys Tyr Cys
405 410 415

Gln Leu Ile Gln Arg Val Asp Gly Tyr Glu Tyr Thr
420 425

<210> 121

<211> 231

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-97 effector

<400> 121

Met Gln Arg Val Phe Val Leu Asp Thr Lys Lys Lys Pro Leu Met Pro
1 5 10 15

Cys His Pro Ala Arg Ala Arg Lys Leu Leu Lys Lys Gly Lys Ala Ala
20 25 30

Val Tyr Arg Arg Tyr Pro Phe Thr Ile Ile Leu Lys Glu Arg Val Asp
35 40 45

Gly Gln Leu Gln Pro Val Glu Ile Lys Phe Asp Pro Gly Ser Arg Thr
50 55 60

Thr Gly Ile Ala Leu Val Gly His Phe Glu Arg Gly Ser Glu Val Ile
65 70 75 80

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

85 90 95

Val Ser Arg Arg Ala Ile Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg
100 105 110
Tyr Arg Pro Ala Arg Phe Leu Asn Arg Arg Arg Pro Lys Ser Trp Leu
115 120 125
Pro Pro Ser Leu Arg Ser Arg Val Asp Asn Val Lys Asn Trp Ala Leu
130 135 140
Lys Leu Ser Arg Leu Ala Pro Ile Thr Gln Ile Ala Val Glu Thr Val
145 150 155 160

Arg Phe Asp Thr Gln Lys Met Gln Asn Pro Glu Val Ser Gly Met Glu
165 170 175
Tyr Gln Gln Gly Glu Leu Ala Gly Tyr Glu Phe Arg Glu Tyr Leu Leu
180 185 190
Glu Lys Trp Gly Arg Gln Cys Ala Tyr Cys Gly Val Gln Asn Val Pro
195 200 205
Leu Glu Val Glu His Ile Gln Pro Arg Ser Lys Glu Gly Ser Asn Arg
210 215 220

Val Ser Asn Leu Thr Leu Ala
225 230

<210> 122
<211> 429
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-98 effector
<400> 122
Met Gln Arg Val Phe Val Leu Asp Thr Lys Lys Lys Pro Leu Met Pro
1 5 10 15
Cys His Pro Ala Arg Ala Arg Lys Leu Leu Lys Lys Gly Lys Ala Ala

20 25 30

Val Tyr Arg Arg Tyr Pro Phe Thr Ile Ile Leu Lys Glu Arg Val Asp
35 40 45
Gly Gln Leu Gln Pro Val Glu Ile Lys Phe Asp Pro Gly Ser Arg Thr
50 55 60
Thr Gly Ile Ala Leu Val Gly His Phe Glu Arg Gly Ser Glu Val Ile
65 70 75 80
Trp Ala Gly Asn Leu Asn His Arg Gly Leu Gln Ile Lys Ser Asn Leu
85 90 95

Val Ser Arg Arg Ala Ile Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg
100 105 110
Tyr Arg Pro Ala Arg Phe Leu Asn Arg Arg Arg Pro Lys Ser Trp Leu
115 120 125
Pro Pro Ser Leu Arg Ser Arg Val Asp Asn Val Lys Asn Trp Ala Leu
130 135 140
Lys Leu Ser Arg Leu Ala Pro Ile Thr Gln Ile Ala Val Glu Thr Val
145 150 155 160

Arg Phe Asp Thr Gln Lys Met Gln Asn Pro Glu Val Ser Gly Met Glu
165 170 175
Tyr Gln Gln Gly Glu Leu Ala Gly Tyr Glu Phe Arg Glu Tyr Leu Leu
180 185 190
Glu Lys Trp Gly Arg Gln Cys Ala Tyr Cys Gly Val Gln Asn Val Pro
195 200 205
Leu Glu Val Glu His Ile Gln Pro Arg Ser Lys Glu Gly Ser Asn Arg
210 215 220

Val Ser Asn Leu Thr Leu Ala Cys Thr Lys Cys Asn Gln Lys Lys Gly
225 230 235 240
Asn Lys Asp Val Lys Asp Phe Leu Lys Gly Lys Pro Asp Arg Leu Lys
245 250 255
Lys Ile Gln Ala Gln Ala Lys Ala Ser Leu Arg Asp Thr Ala Ala Val
260 265 270

Asn Ala Thr Arg Tyr Ala Ile Gly Glu Ala Leu Lys Thr Phe Gly Phe
275 280 285

Val Ile Ser Phe Ser Ser Gly Gly Arg Thr Lys Phe Asn Arg Thr Gln
290 295 300
Gln Gly Tyr Pro Lys Glu His Trp Val Asp Ala Ala Cys Val Gly Glu
305 310 315 320
Asn Gly Asn Pro Val Ala Ile Pro Lys Ala Ile Thr Pro Leu Ile Ile
325 330 335
Thr Ala Lys Gly Arg Gly Ser Arg Gln Lys Cys Arg Met Asn Lys Tyr
340 345 350

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

Gln Leu Leu Gln Arg Ser Asp Gly Tyr Asp Tyr Leu Lys
420 425

<210> 123
<211> 424
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-99 effector
<400> 123
Met Ser Asn Phe Ile Phe Val Leu Asp Thr Lys Arg Arg Pro Leu Ser
1 5 10 15

Pro Cys Lys Pro Gly Val Gly Arg Ser Leu Leu Lys Val Gly Lys Ala

20 25 30

Ser Val Phe Arg Arg Phe Pro Phe Thr Val Ile Leu Asn Lys Glu Val

35 40 45

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

50 55 60

Thr Thr Gly Ile Val Ile Asn Gln Gly Gly Lys Ile Ile Phe Gly Ala

65 70 75 80

Glu Leu Gln His Arg Gly Gln Gln Ile Lys Asp Ala Leu Leu Ser Arg

85 90 95

His Gln Leu Arg Leu Arg Arg Arg Asn Arg Lys Thr Arg Tyr Arg Gln

100 105 110

Ala Arg Phe Leu Asn Arg Thr Arg His Asp Gly Trp Leu Ala Pro Ser

115 120 125

Leu Gln His Arg Ile Glu Thr Thr Leu Thr Trp Val Arg Lys Leu Ile

130 135 140

Arg Phe Ala Pro Ile Ile Ser Ile Ala Gln Glu Leu Val Arg Phe Asp

145 150 155 160

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

165 170 175

Gly Gln Leu His Gly Tyr Glu Val Arg Glu Tyr Leu Leu Thr Lys Trp

180 185 190

Asn Arg Lys Cys Ala Tyr Cys Ser Val Glu Asn Val Pro Phe Glu Ile

195 200 205

Glu His Ile Gln Pro Lys Ser Lys Gly Gly Ser Asp Arg Val Ser Asn

210 215 220

Leu Thr Ile Ala Cys His Asp Cys Asn Gln Lys Lys Gly Asn Gln Asp

225 230 235 240

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

245 250 255

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

260 265 270

Arg Trp Ala Leu Phe Asn Ala Leu Lys Glu Thr Gly Leu Ser Val Thr

275 280 285

Thr Gly Thr Gly Gly Gln Thr Lys Phe Asn Arg Asn Arg Leu Gly Leu

290 295 300

Pro Lys Ser His Trp Leu Asp Ala Ala Cys Val Gly Asn Val Glu Thr

305 310 315 320

Leu Glu Ile Leu Thr Ser Lys Pro Leu Leu Ile Ala Ala Lys Gly His

325 330 335

Gly Thr Arg Gln Met Cys Gly Thr Asn Lys Tyr Gly Phe Pro Ile Arg

340 345 350

His Lys Ser Arg Val His Ile His Lys Gly Phe Gln Thr Gly Asp Ile

355 360 365

Val Asn Ala Thr Val Thr Ala Gly Lys Lys Val Gly Ser Tyr Val Gly

370 375 380

Arg Val Leu Cys Arg Ala Ser Gly Ser Phe Asp Ile Val Thr Lys Thr

385 390 395 400

Gly Arg Val Ala Gly Ile Ser His Lys Tyr Cys Lys Ala Ile His Lys

405 410 415

Lys Asp Gly Tyr Ser Tyr Gly Phe

420

<210> 124

<211> 424

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-100 effector

<400> 124

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

1 5 10 15

Pro Cys Lys Pro Gly Val Gly Arg Ser Leu Leu Lys Val Gly Lys Ala

20 25 30

Ser Val Phe Arg Arg Phe Pro Phe Thr Val Ile Leu Asn Lys Glu Val

35 40 45

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

50 55 60

Thr Thr Gly Ile Val Ile Asn Gln Gly Gly Lys Ile Ile Phe Gly Ala

65 70 75 80

Glu Leu Gln His Arg Gly Gln Gln Ile Lys Asp Ala Leu Leu Ser Arg

85 90 95

His Gln Leu Arg Leu Arg Arg Arg Asn Arg Lys Thr Arg Tyr Arg Gln

100 105 110

Ala Arg Phe Leu Asn Arg Thr Arg Pro Asp Gly Trp Leu Ala Pro Ser

115 120 125

Leu Gln His Arg Ile Glu Thr Thr Leu Thr Trp Val Arg Lys Leu Ile

130 135 140

Arg Phe Ala Pro Ile Ile Ser Ile Ala Gln Glu Leu Val Arg Phe Asp

145 150 155 160

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

165 170 175

Gly Gln Leu His Gly Tyr Glu Val Arg Glu Tyr Leu Leu Thr Lys Trp

180 185 190

Asn Arg Lys Cys Ala Tyr Cys Ser Val Glu Asn Val Pro Phe Glu Ile

195 200 205

Glu His Ile Gln Pro Lys Ser Lys Gly Gly Ser Asp Arg Val Ser Asn

210 215 220

Leu Thr Ile Ala Cys His Asp Cys Asn Gln Lys Lys Gly Asn Gln Asp

225 230 235 240

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

245 250 255

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

260 265 270

Arg Trp Ala Leu Phe Asn Ala Leu Lys Glu Thr Gly Leu Ser Val Thr

275 280 285

Thr Gly Thr Gly Gly Gln Thr Lys Phe Asn Arg Asn Arg Leu Gly Leu

290 295 300

Pro Lys Ser His Trp Leu Asp Ala Ala Cys Val Gly Asn Val Glu Thr

305 310 315 320

Leu Glu Ile Leu Thr Ser Lys Pro Leu Leu Ile Ala Ala Lys Gly His

325 330 335

Gly Thr Arg Gln Met Cys Gly Thr Asn Lys Tyr Gly Phe Pro Ile Arg

340 345 350

His Lys Ser Arg Val His Ile His Lys Gly Phe Gln Thr Gly Asp Ile

355 360 365

Val Asn Ala Thr Val Thr Ala Gly Lys Lys Val Gly Ser Tyr Val Gly

370 375 380

Arg Val Leu Cys Arg Ala Ser Gly Ser Phe Asp Ile Val Thr Lys Thr

385 390 395 400

Gly Arg Val Ala Gly Ile Ser His Lys Tyr Cys Lys Ala Ile His Lys

405 410 415

Lys Asp Gly Tyr Ser Tyr Gly Phe

420

<210> 125

<211> 429

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-101 effector

<400> 125

Met Ser Asn Phe Ile Phe Val Leu Asp Thr Asn Lys Gly Pro Leu Asp

1 5 10 15

Arg Val His Pro Gly Lys Ala Arg Arg Leu Leu Ser Thr Gly Asn Ala

20 25 30

Ala Val Phe Arg Arg Tyr Pro Phe Thr Ile Ile Leu Lys Gln Ala Tyr

35 40 45

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

50 55 60

Gln Val Thr Gly Ile Ala Val Val Gln Gly Thr Lys Val Ile Phe Gly

65 70 75 80

Ala Glu Leu Glu His Arg Gly Gln Gln Ile Lys Asp Ala Leu Leu Ser

85 90 95

Arg Arg Gln Leu Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg

100 105 110

Gln Ala Arg Phe Leu Asn Arg Thr Arg Pro Lys Gly Trp Leu Pro Pro

115 120 125

Ser Leu Gln His Arg Val Asp Thr Thr Met Thr Trp Val Asn Arg Phe

130 135 140

Arg Arg Leu Ala Pro Ile Ala Arg Ile Ala Gln Glu Leu Val Arg Phe

145 150 155 160

Asp Leu Gln Leu Ile Gln Asn Pro Glu Ile Ser Gly Ile Glu Tyr Gln

165 170 175

Gln Gly Glu Leu Gln Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys

180 185 190

Trp Asn Arg Lys Cys Ala Tyr Cys Gly Ala Glu Asn Leu Pro Leu Glu

195 200 205

Leu Glu His Ile His Pro Arg Ser Lys Gly Gly Thr Asp Arg Val Ser

210 215 220

Asn Leu Thr Leu Ala Cys His Ser Cys Asn Gln Ser Lys Ser Asn Arg

225 230 235 240

Asp Ile Arg Asp Phe Leu Ser Gly Lys Pro Ser Leu Leu Asn Arg Ile

245 250 255

Leu Lys Gln Ser Gln Ser Pro Leu Lys Asp Ala Ala Ala Val Asn Leu

260 265 270

Thr Arg Trp Ala Leu Phe Asn Ala Leu Lys Gln Thr Gly Leu Pro Val

275 280 285

Ala Thr Gly Thr Gly Gly Gln Thr Lys Phe Asn Arg Thr Arg Leu Asn

290 295 300

Leu Pro Lys Thr His Trp Leu Asp Ala Ala Ser Val Gly Lys Ile Asp

305 310 315 320

Ser Leu Lys Val Leu Thr Thr Asn Pro Leu Leu Ile Ala Ala Lys Gly

325 330 335

His Gly Thr Arg Gln Met Cys Gly Thr Asp Lys Phe Gly Phe Pro Lys

340 345 350

Arg His Arg Ser Arg Val Gln Ile His Gln Gly Phe Arg Thr Gly Asp

355 360 365

Ile Val Thr Ala Ile Val Thr Lys Gly Lys Lys Ile Gly Ser Tyr Val

370 375 380

Gly Arg Val Leu Cys Arg Ala Ser Gly Ser Phe Asp Ile Thr Thr Gln

385 390 395 400

Ser Gly Arg Val Ser Gly Ile Ser His Arg Tyr Cys Gln Pro Ile His

405 410 415

Lys Arg Asp Gly Tyr Ala Tyr Ala Phe Ala His Thr Leu

420 425

<210> 126

<211> 424

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-102 effector

<400> 126

Met Ser Asn Phe Val Phe Val Ile Asp Thr Asn His Lys Pro Leu Ser

1 5 10 15

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

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

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

Glu His Ile Gln Pro Lys Ser Lys Gly Gly Ser Asp Arg Val Pro Asn
210 215 220
Leu Thr Leu Ala Cys His Asp Cys Asn Gln Lys Lys Gly Asn Gln Asp
225 230 235 240
Val Arg Ala Phe Leu Ala Thr Lys Pro Asp Leu Leu Asn Arg Ile Leu
245 250 255

Lys Gln Ala Lys Leu Pro Leu Lys Asp Ala Ala Ala Val Asn Ser Thr
260 265 270

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

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

Gly Arg Ile Thr Gly Ile Ser His Lys Tyr Cys Asn Pro Ile His Lys
405 410 415
Lys Asp Gly Tyr Ser Tyr Ala Phe
420

<210> 127
<211> 224
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-103 effector
<400> 127
Met Ser Asn Phe Val Phe Val Leu Asp Thr Asp Lys Arg Ser Leu Asp

1 5 10 15

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

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

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

Val Glu His Ile Gln Pro Lys Ser Lys Gly Gly Ser Asp Arg Val Ser
210 215 220

<210> 128

<211> 425

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-104 effector
<400> 128

Met Ser Asn Phe Val Phe Val Leu Asp Thr Asp Lys Arg Ser Leu Asp
1 5 10 15
Pro Ile His Pro Gly Thr Ala Arg His Leu Leu Asn Gln Gly Lys Ala

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

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

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

Val Glu His Ile Gln Pro Lys Ser Lys Gly Gly Ser Asp Arg Val Ser

210 215 220

Asn Leu Thr Leu Ala Cys His Pro Cys Asn Gln Ser Lys Gly Asn Gln
225 230 235 240
Asp Val Arg Asp Phe Leu Ser Asn Lys Pro Asp Leu Leu Asn Arg Ile
245 250 255
Leu Lys Gln Ala Lys Ser Pro Leu Lys Asp Ala Ala Ala Val Asn Ser
260 265 270
Thr Arg Trp Ala Leu Phe Asn Ala Leu Lys Ala Thr Ser Leu Pro Val

275 280 285

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

340 345 350

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

405 410 415

Lys Lys Asp Gly Phe Ala Tyr Glu Phe

420 425

<210> 129

<211> 425

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-105 effector

<400> 129

Met Ser Asn Phe Val Phe Val Leu Asp Thr Asn Lys Arg Pro Leu Asp
1 5 10 15
Pro Val His Pro Gly Ala Ala Arg His Leu Leu Asn Ala Gly Lys Ala

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

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

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

Ile Glu His Ile Gln Pro Lys Ser Lys Gly Gly Ser Asp Arg Val Ser

210 215 220

Asn Leu Ala Leu Ala Cys His Pro Cys Asn Gln Ser Lys Gly Asn Gln
225 230 235 240
Asp Ile Arg Asp Phe Leu Ala Asp Lys Pro Asp Leu Leu Ser Arg Ile
245 250 255
Leu Lys Gln Ala Lys Ser Pro Leu Lys Asp Ala Ala Ala Val Asn Ser
260 265 270
Thr Arg Trp Ala Leu Phe Asn Ala Leu Lys Ile Thr Gly Leu Pro Val

275 280 285

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

340 345 350

Arg His Lys Ser Arg Val Gln Ile His Lys Gly Phe Gln Thr Gly Asp
355 360 365
Ile Val Thr Ala Thr Val Thr Ala Gly Lys Lys Ile Gly Ser Tyr Val
370 375 380
Gly Arg Val Leu Cys Arg Ala Ser Gly Ser Phe Asp Ile Asn Thr Thr
385 390 395 400
Ala Gly Arg Val Ala Gly Ile Ser His Lys Tyr Cys Lys Pro Ile His

405 410 415

Lys Lys Asp Gly Tyr Ser Tyr Gly Phe

420 425

<210> 130

<211> 180

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-106 effector

<400> 130

Met Ser Asn His Val Phe Val Ile Asp Thr Asn Lys Lys Pro Val Gly
1 5 10 15
Thr Val His Pro Ala Tyr Ala Arg Lys Leu Leu Ser Ser Gln Gln Ala

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

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

145 150 155 160
Phe Asp Thr Gln Lys Leu Gln Asn Pro Glu Ile Ser Gly Glu Glu Tyr
165 170 175
Gln Gln Gly Thr
180

<210> 131

<211> 347

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-107 effector

<400> 131

Met Ser Asn His Val Phe Val Ile Asp Thr Asn Lys Lys Pro Val Gly

1 5 10 15

Thr Val His Pro Ala Tyr Ala Arg Lys Leu Leu Ser Ser Gln Gln Ala

20 25 30

Ala Val Phe Arg Arg Tyr Pro Phe Thr Ile Ile Leu Lys Thr Ser Val

35 40 45

Pro Glu Gly Phe Gln Pro Arg Ala Leu Arg Val Lys Ile Asp Pro Gly

50 55 60

Ala Lys Thr Thr Gly Ile Val Val Leu Asp Gly Asn Lys Val Val Trp

65 70 75 80

Ala Ala Glu Leu Thr His Arg Gly Glu Gln Ile Arg Asn Arg Leu Thr

85 90 95

Ser Arg Arg Gln Ile Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr

100 105 110

Arg Pro Ala Arg Phe Leu Asn Arg Thr Arg Asp Lys Glu Trp Leu Ala

115 120 125

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

130 135 140

Leu Arg Arg Val Ser Asn Ile Thr Ala Ile Ser Gln Glu Leu Val Arg

145 150 155 160

Phe Asp Thr Gln Lys Leu Gln Asn Pro Glu Ile Ser Gly Glu Glu Tyr

165 170 175

Gln Gln Gly Thr Leu Tyr Gln Tyr Glu Val Arg Glu Tyr Leu Leu Glu

180 185 190

Lys Trp Gly Arg Lys Cys Ala Tyr Cys Gly Ala Lys Asp Val Pro Leu

195 200 205

Gln Val Glu His Ile Val Pro Arg Ser Lys Gly Gly Ser Asn Arg Val

210 215 220

Ser Asn Leu Thr Leu Ala Cys Val Ser Cys Asn Gln Ala Lys Gly Asn

225 230 235 240

Gln Asp Ile Arg Glu Phe Leu Lys His Lys Pro Glu Leu Leu Ser Arg

245 250 255

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

260 265 270

Thr Ala Arg Trp Val Leu Phe Asn Arg Leu Lys Glu Thr Gly Leu Pro

275 280 285

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

290 295 300

Gln Leu Pro Lys Ala His Trp Ile Asp Ala Ala Cys Val Gly Ala Ser

305 310 315 320

Thr Pro Asn Leu Val Phe Val Thr Lys Gln Pro Leu Gln Ile Lys Ala

325 330 335

Lys Gly His Gly Thr Arg Gln Met Cys Ile Thr

340 345

<210> 132

<211> 424

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-108 effector

<400> 132

Met Ser Asn His Val Phe Val Leu Asp Thr Asn His Lys Gln Leu Thr

1 5 10 15

Pro Cys Lys Pro Gly Val Ala Arg Ser Leu Leu Asn Thr Gly Lys Ala

20 25 30

Ala Val Phe Arg Arg Tyr Pro Phe Thr Ile Ile Leu Lys Lys Glu Val

35 40 45

Asn Ala His Pro Glu Pro Ile Glu Leu Lys Leu Asp Pro Gly Ser Arg

50 55 60

Val Thr Gly Ile Ala Leu Lys Gln Gly Asn Gln Ile Ile Phe Gly Ala

65 70 75 80

Glu Leu Gln His Arg Gly Gln Gln Ile Lys Asp Ala Leu Leu Ser Arg

85 90 95

Arg Gln Leu Arg Arg Gly Arg Arg Asn Arg Lys Thr Arg Tyr Arg Gln

100 105 110

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

115 120 125

Leu Gln His Arg Val Ala Thr Val Leu Thr Trp Gly Asn Arg Phe Arg

130 135 140

Lys Ile Ala Pro Ile Ala Ser Ile Ala Gln Glu Leu Val Arg Phe Asp

145 150 155 160

Leu Gln Leu Met Gln Asn Pro Glu Met Ser Gly Val Glu Tyr Gln Gln

165 170 175

Gly Glu Leu Gln Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys Trp

180 185 190

Asn Arg Lys Cys Ala Tyr Cys Gly Ala Glu Asn Val Pro Leu Glu Val

195 200 205

Glu His Ile Gln Pro Arg Ser Lys Gly Gly Ser Asp Arg Val Ser Asn

210 215 220

Leu Ala Leu Ala Cys Asn Pro Cys Asn Gln Ser Lys Gly Ser Gln Asp

225 230 235 240

Ile Arg Asp Phe Leu Ser Gly Lys Pro Asp Leu Leu Asn Arg Ile Leu

245 250 255

Lys Gln Ser Lys Ser Pro Leu Arg Asp Ala Ala Ala Val Asn Ser Thr

260 265 270

Arg Trp Ala Leu Asn Asn Ala Leu Lys Ala Thr Gly Leu Pro Val Thr

275 280 285

Thr Gly Thr Gly Gly Gln Thr Lys Phe Asn Arg Thr Arg Leu Asn Leu

290 295 300

Pro Lys Ala His Trp Leu Asp Ala Ala Cys Val Gly Gln Val Glu Thr

305 310 315 320

Leu Lys Ile Leu Thr Ser Lys Pro Leu Leu Ile Ala Ala Lys Gly His

325 330 335

Gly Thr Arg Gln Met Cys Gly Thr Asp Lys Phe Gly Phe Pro Asn Arg

340 345 350

His Arg Ser Arg Val Gln Val His Lys Gly Phe Gln Thr Gly Asp Ile

355 360 365

Val Ile Ala Thr Val Thr Ala Gly Lys Lys Ile Gly Ser Tyr Val Gly

370 375 380

Arg Val Leu Cys Arg Ala Ser Gly Ser Phe Asp Ile Ala Thr Lys Thr

385 390 395 400

Gly Arg Val Ala Gly Ile Ser His Lys Tyr Cys Lys Pro Ile His Lys

405 410 415

Lys Asp Gly Tyr Ala Tyr Thr Phe

420

<210> 133

<211> 427

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-109 effector

<400> 133

Met Ser Asn Tyr Val Phe Val Ile Asp Thr Asn Lys Lys Pro Val Gly

1 5 10 15

Thr Val His Pro Ala Cys Ala Arg Lys Leu Leu Ser Ser Gln Gln Ala

20 25 30

Ala Val Phe Arg Arg Tyr Pro Phe Thr Ile Ile Leu Lys Thr Ser Val

35 40 45

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

50 55 60

Ala Lys Thr Thr Gly Ile Ala Val Leu Asp Gly Asn Lys Val Val Trp

65 70 75 80

Ala Ala Glu Leu Thr His Arg Gly Glu Gln Ile Arg Asn Arg Leu Thr

85 90 95

Ser Arg Arg Gln Ile Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr

100 105 110

Arg Pro Ala Arg Phe Leu Asn Arg Thr Arg Asp Lys Gly Trp Leu Ala

115 120 125

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

130 135 140

Leu Arg Arg Val Ser Asn Ile Thr Ala Ile Ser Gln Glu Leu Val Arg

145 150 155 160

Phe Asp Thr Gln Lys Leu Gln Asn Pro Glu Ile Ser Gly Glu Glu Tyr

165 170 175

Gln Gln Gly Thr Leu Tyr Gln Tyr Glu Val Arg Glu Tyr Leu Leu Glu

180 185 190

Lys Trp Gly Arg Lys Cys Ala Tyr Cys Gly Ala Thr Asn Val Pro Leu

195 200 205

Gln Val Glu His Ile Val Pro Arg Ser Lys Gly Gly Ser Asn Arg Val

210 215 220

Ser Asn Leu Thr Leu Ala Cys Val Ser Cys Asn Gln Thr Lys Gly Asn

225 230 235 240

Gln Asp Ile Arg Glu Phe Leu Lys His Lys Pro Glu Leu Leu Ser Arg

245 250 255

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

260 265 270

Thr Thr Arg Trp Ala Leu Phe Asn Arg Leu Lys Glu Thr Gly Leu Pro

275 280 285

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

290 295 300

Gln Leu Pro Lys Ala His Trp Ile Asp Ala Ala Cys Val Gly Ala Ser

305 310 315 320

Thr Pro Asn Leu Val Phe Val Thr Lys Gln Pro Leu Gln Ile Lys Ala

325 330 335

Lys Gly His Gly Thr Arg Gln Met Cys Ile Thr Asp Lys Tyr Gly Phe

340 345 350

Pro Lys Gln His Arg Thr Arg Val Gln Ile His Lys Gly Phe Arg Thr

355 360 365

Gly Asp Ile Val Arg Ala Val Val Thr Lys Gly Lys Lys Ile Gly Thr

370 375 380

Tyr Ile Gly Arg Val Val Cys Arg Ala Ser Gly Ser Phe Asp Ile Thr

385 390 395 400

Thr Lys Gln Gly Lys Ile Ala Ser Ile Asn Tyr Lys Tyr Cys Thr Val

405 410 415

Ile Asn Lys Lys Asp Gly Tyr Glu Tyr Ala Phe

420 425

<210> 134

<211> 427

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-110 effector

<400> 134

Met Ser Asn Tyr Val Phe Val Ile Asp Thr Asn Lys Lys Pro Val Gly

1 5 10 15

Thr Val His Pro Ala Cys Ala Arg Lys Leu Leu Ser Ser Gln Gln Ala

20 25 30

Ala Val Phe Arg Arg Tyr Pro Phe Thr Ile Ile Leu Lys Thr Ser Val

35 40 45

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

50 55 60

Ala Lys Thr Thr Gly Ile Ala Val Leu Asp Gly Asn Lys Val Val Trp

65 70 75 80

Ala Ala Glu Leu Thr His Arg Gly Glu Gln Ile Arg Asn Arg Leu Thr

85 90 95

Ser Arg Arg Gln Ile Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr

100 105 110

Arg Pro Ala Arg Phe Leu Asn Arg Thr Arg Asp Lys Gly Trp Leu Ala

115 120 125

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

130 135 140

Leu Arg Arg Val Ser Asn Ile Thr Ala Ile Ser Gln Glu Leu Val Arg

145 150 155 160

Phe Asp Thr Gln Lys Leu Gln Asn Pro Glu Ile Ser Gly Glu Glu Tyr

165 170 175

Gln Gln Gly Thr Leu Tyr Gln Tyr Glu Val Arg Glu Tyr Leu Leu Glu

180 185 190

Lys Trp Gly Arg Lys Cys Ala Tyr Cys Gly Ala Thr Asn Val Pro Leu

195 200 205

Gln Val Glu His Ile Val Pro Arg Ser Lys Gly Gly Ser Asn Arg Val

210 215 220

Ser Asn Leu Thr Leu Ala Cys Met Ser Cys Asn Gln Ala Lys Gly Asn

225 230 235 240

Gln Asp Ile Arg Glu Phe Leu Lys His Lys Pro Glu Leu Leu Ser Arg

245 250 255

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

260 265 270

Thr Ala Arg Trp Val Leu Phe Asn Arg Leu Lys Glu Thr Gly Leu Pro

275 280 285

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

290 295 300

Gln Leu Pro Lys Ala His Trp Ile Asp Ala Ala Cys Val Gly Ala Ser

305 310 315 320

Thr Pro Asn Leu Val Phe Val Thr Lys Gln Pro Leu Gln Ile Lys Val

325 330 335

Lys Gly His Gly Thr Arg Gln Met Cys Ile Thr Asp Lys Tyr Gly Phe

340 345 350

Pro Arg Gln His Arg Thr Arg Val Gln Ile His Lys Gly Phe Arg Thr

355 360 365

Gly Asp Ile Val Arg Ala Val Val Thr Arg Gly Lys Lys Val Gly Lys

370 375 380

Tyr Ile Gly Arg Val Val Cys Arg Ala Ser Gly Ser Phe Asp Ile Thr

385 390 395 400

Thr Lys Gln Gly Arg Ile Thr Gly Ile Ser Tyr Lys Tyr Cys Lys Thr

405 410 415

Val His Lys Lys Asp Gly Tyr Glu Tyr Ala Phe

420 425

<210> 135

<211> 427

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-111 effector

<400> 135

Met Ser Asn Tyr Val Phe Val Ile Asp Thr Asn Lys Lys Pro Val Gly

1 5 10 15

Thr Val His Pro Ala Cys Ala Arg Lys Leu Leu Ser Ser Gln Gln Ala

20 25 30

Ala Val Phe Arg Arg Tyr Pro Phe Thr Ile Ile Leu Lys Thr Ser Val

35 40 45

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

50 55 60

Ala Lys Thr Thr Gly Ile Ala Val Leu Asp Gly Asn Lys Val Val Trp

65 70 75 80

Ala Ala Glu Leu Thr His Arg Gly Glu Gln Ile Arg Asn Arg Leu Thr

85 90 95

Ser Arg Arg Gln Ile Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr

100 105 110

Arg Pro Ala Arg Phe Leu Asn Arg Thr Arg Asp Lys Gly Trp Leu Ala

115 120 125

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

130 135 140

Leu Arg Arg Val Ser Asn Ile Thr Ala Ile Ser Gln Glu Leu Val Arg

145 150 155 160

Phe Asp Thr Gln Lys Leu Gln Asn Pro Glu Ile Ser Gly Glu Glu Tyr

165 170 175

Gln Gln Gly Thr Leu Tyr Gln Tyr Glu Val Arg Glu Tyr Leu Leu Glu

180 185 190

Lys Trp Gly Arg Lys Cys Ala Tyr Cys Gly Ala Thr Asn Val Pro Leu

195 200 205

Gln Val Glu His Ile Val Pro Arg Ser Lys Gly Gly Ser Asn Arg Val

210 215 220

Ser Asn Leu Thr Leu Ala Cys Val Ser Cys Asn Gln Thr Lys Gly Asn

225 230 235 240

Gln Asp Ile Arg Glu Phe Leu Lys His Lys Pro Glu Leu Leu Ser Arg

245 250 255

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

260 265 270

Thr Thr Arg Trp Ala Leu Phe Asn Arg Leu Lys Glu Thr Gly Leu Pro

275 280 285

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

290 295 300

Gln Leu Pro Lys Ala His Trp Ile Asp Ala Ala Cys Val Gly Ala Ser

305 310 315 320

Thr Pro Asn Leu Val Phe Val Thr Lys Gln Pro Leu Gln Ile Lys Ala

325 330 335

Lys Gly His Gly Thr Arg Gln Met Cys Ile Thr Asp Lys Tyr Gly Phe

340 345 350

Pro Lys Gln His Arg Thr Arg Val Gln Ile His Lys Gly Phe Arg Thr

355 360 365

Gly Asp Ile Val Arg Ala Val Val Thr Lys Gly Lys Lys Ile Gly Thr

370 375 380

Tyr Ile Gly Arg Val Val Cys Arg Ala Ser Gly Ser Phe Asp Ile Ala

385 390 395 400

Thr Lys Gln Gly Arg Ile Thr Gly Ile Ser Tyr Lys Tyr Cys Lys Thr

405 410 415

Val His Lys Lys Asp Gly Tyr Glu Tyr Ala Phe

420 425

<210> 136

<211> 427

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-112 effector

<400> 136

Met Ser Asn Tyr Val Phe Val Ile Asp Thr Asn Lys Lys Pro Val Gly

1 5 10 15

Thr Val His Pro Ala Cys Ala Arg Lys Leu Leu Ser Ser Gln Gln Ala

20 25 30

Ala Val Phe Arg Arg Tyr Pro Phe Thr Ile Ile Leu Lys Thr Ser Val

35 40 45

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

50 55 60

Ala Lys Thr Thr Gly Ile Ala Val Leu Asp Gly Asn Lys Val Val Trp

65 70 75 80

Ala Ala Glu Leu Thr His Arg Gly Glu Gln Ile Arg Asn Arg Leu Thr

85 90 95

Ser Arg Arg Gln Ile Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr

100 105 110

Arg Pro Ala Arg Phe Leu Asn Arg Thr Arg Asp Lys Gly Trp Leu Ala

115 120 125

Pro Ser Leu Arg Ser Arg Val Glu Asn Ile Leu Thr Trp Val Asn Arg

130 135 140

Leu Arg Arg Val Ser Asn Ile Thr Ala Ile Ser Gln Glu Leu Val Arg

145 150 155 160

Phe Asp Thr Gln Lys Leu Gln Asn Pro Glu Ile Ser Gly Glu Glu Tyr

165 170 175

Gln Gln Gly Thr Leu Tyr Gln Tyr Glu Val Arg Glu Tyr Leu Leu Glu

180 185 190

Lys Trp Gly Arg Lys Cys Ala Tyr Cys Gly Ala Thr Asn Val Pro Leu

195 200 205

Gln Val Glu His Ile Val Pro Arg Ser Lys Gly Gly Ser Asn Arg Val

210 215 220

Ser Asn Leu Thr Leu Ala Cys Val Ser Cys Asn Gln Thr Lys Gly Asn

225 230 235 240

Lys Asp Ile Arg Glu Phe Leu Lys His Lys Pro Glu Leu Leu Ser Arg

245 250 255

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

260 265 270

Thr Thr Arg Trp Ala Leu Phe Asn Arg Leu Lys Glu Thr Gly Leu Pro

275 280 285

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

290 295 300

Gln Leu Pro Lys Ala His Trp Ile Asp Ala Ala Cys Val Gly Ala Ser

305 310 315 320

Thr Pro Asn Leu Val Phe Val Thr Lys Gln Pro Leu Gln Ile Lys Ala

325 330 335

Lys Gly His Gly Thr Arg Gln Met Cys Ile Thr Asp Lys Tyr Gly Phe

340 345 350

Pro Lys Gln His Arg Thr Arg Val Gln Ile His Lys Gly Phe Arg Thr

355 360 365

Gly Asp Ile Val Arg Ala Val Val Thr Lys Gly Lys Lys Ile Gly Thr

370 375 380

Tyr Ile Gly Arg Val Val Cys Arg Ala Ser Gly Ser Phe Asp Ile Ala

385 390 395 400

Thr Lys Gln Gly Lys Ile Thr Gly Ile Asn Tyr Lys Tyr Cys Lys Thr

405 410 415

Val His Lys Lys Asp Gly Tyr Glu Tyr Ala Phe

420 425

<210> 137

<211> 425

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-113 effector

<400> 137

Met Ser Asn Tyr Val Leu Val Leu Asp Ala Glu Lys Arg Pro Leu Asp

1 5 10 15

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

20 25 30

Ala Val Phe Arg Arg Phe Pro Phe Thr Ile Ile Leu Lys Glu Ser Arg

35 40 45

Pro Asp Ala Pro Val Gln Asp Leu Glu Leu Lys Leu Asp Pro Gly Ser

50 55 60

Lys Val Thr Gly Ile Ala Ile Lys Gln Gly Asn Lys Val Ile Phe Gly

65 70 75 80

Ala Glu Leu Gln His Arg Gly Gln Gln Ile Lys Asp Ala Leu Leu Ser

85 90 95

Arg Arg Gln Leu Arg Arg Gly Arg Arg Asn Arg Lys Thr Arg Tyr Arg

100 105 110

Gln Ala Arg Phe Leu Asn Arg Thr Arg Pro Asp Gly Trp Leu Ala Pro

115 120 125

Ser Leu Gln His Arg Val Leu Thr Thr Leu Thr Trp Val Arg Lys Phe

130 135 140

Met Arg Leu Ala Pro Ile Thr Asn Ile Thr Gln Glu Leu Val Arg Phe

145 150 155 160

Asp Leu Gln Leu Met Gln Asn Pro Glu Ile Ser Gly Ile Gln Tyr Gln

165 170 175

Gln Gly Glu Leu Gln Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys

180 185 190

Trp Asn Arg Lys Cys Ala Tyr Cys Ser Val Glu Asn Val Pro Leu Glu

195 200 205

Val Glu His Ile Gln Pro Arg Ser Lys Gly Gly Ser Asp Arg Val Ser

210 215 220

Asn Leu Thr Ile Ala Cys His Ala Cys Asn Gln Ser Lys Gly Asn Gln

225 230 235 240

Asp Ile Arg Asp Phe Leu Ala Gly Lys His Asp Leu Leu Asn Arg Ile

245 250 255

Leu Lys Gln Ala Lys Ser Pro Leu Lys Asp Ala Ala Ala Val Asn Ser

260 265 270

Thr Arg Trp Ala Leu Phe Asn Ala Leu Lys Glu Thr Gly Leu Pro Val

275 280 285

Ala Thr Gly Thr Gly Gly Gln Thr Lys Phe Asn Arg Thr Arg Leu Gly

290 295 300

Leu Pro Lys Thr His Trp Leu Asp Ala Ala Cys Val Gly Asn Val Glu

305 310 315 320

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

325 330 335

His Gly Thr Arg Gln Met Cys Gly Thr Asn Lys Phe Gly Phe Pro Thr

340 345 350

Arg His Lys Ser Arg Val Gln Ile His Lys Gly Phe Gln Thr Gly Asp

355 360 365

Ile Val Arg Ala Thr Val Thr Ala Gly Lys Lys Ile Gly Ser Tyr Val

370 375 380

Gly Arg Val Leu Cys Arg Ala Ser Gly Ser Phe Asp Ile Ala Thr Thr

385 390 395 400

Asp Gly Arg Val Ala Gly Ile Ser His Lys Tyr Cys Lys Pro Ile His

405 410 415

Lys Lys Asp Gly Tyr Leu Tyr Gly Phe

420 425

<210> 138

<211> 490

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-114 effector

<400> 138

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

1 5 10 15

His Gln Pro Gln Ala Leu Ser Pro Thr Thr Lys Lys Arg Ala Thr Thr

20 25 30

Arg Leu Pro Thr Ser Arg Leu Asn Asp Leu Arg Ala Pro Gly Glu Val

35 40 45

Thr Ile Thr Cys Ala Ser Arg Arg Gly Arg Leu Leu Ala Tyr Ser Arg

50 55 60

Pro Lys Thr Pro Arg Val Phe Val Leu Ser Asn Thr Leu Lys Pro Leu

65 70 75 80

Met Pro Cys Arg Pro Ala Arg Ala Gln Asp Leu Leu Ala Cys Gly Arg

85 90 95

Ala Ala Val Tyr Arg Leu Gln Pro Phe Thr Ile Val Leu Lys Asp Arg

100 105 110

Ala Asp Gly Asn Val Gln Pro Val Glu Phe Lys Val Asp Pro Gly Ser

115 120 125

Lys Val Thr Gly Leu Ala Leu Val Ala Glu Phe Glu Lys Arg Gly Arg

130 135 140

Thr Val Val Trp Ala Ala Asn Leu Ala His Arg Gly Tyr Arg Val Lys

145 150 155 160

Ala Ser Ile Thr Asp Arg Ala Met Phe Arg Arg Gly Arg Arg Gly Arg

165 170 175

Lys Thr Arg Tyr Arg Ala Ala Arg Phe Glu Asn Arg Thr Arg Pro Thr

180 185 190

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

195 200 205

Trp Tyr Ser Arg Leu Leu Ser Arg Ala Pro Ile Ser Val Ala Gln Val

210 215 220

Glu Thr Ser Ser Phe Asp Thr Gln Leu Met Glu Asn Ala Asp Ile Ser

225 230 235 240

Gly Val Glu Tyr Gln Gln Gly Glu Leu Gln Gly Tyr Glu Val Arg Gln

245 250 255

Tyr Val Leu Glu Arg Gly Gly His Thr Cys Ser Tyr Cys Asp Ala Lys

260 265 270

Asp Val Ala Leu His Leu Asp His Val Leu Pro Arg Ser Arg Gly Gly

275 280 285

Ser Asn Arg Val Ser Asn Leu Val Pro Ala Cys Lys Pro Cys Asn Asp

290 295 300

Ala Lys Ser Asn Arg Ala Val Glu Asp Tyr Leu Val Asp Arg Pro Glu

305 310 315 320

Val Leu Arg Gln Val Lys Ala Gln Leu Arg Ser Pro Leu Arg Asp Ala

325 330 335

Ala Val Met Asn Ala Thr Arg Phe Ala Ile Val Asp Ala Leu Arg Glu

340 345 350

Phe Gly Leu Glu Val Arg Met Trp Ser Gly Gly Arg Thr Lys Trp Asn

355 360 365

Arg Thr Asn Leu Gly Leu Pro Lys Asp His Trp Ile Asp Ala Ala Cys

370 375 380

Val Gly Glu Ser Gly Ala Ala Val Arg Val Pro Val Leu Arg Pro Leu

385 390 395 400

Thr Ile Ser Ala Met Gly Arg Gly His Arg Arg Val His Gly Asn Asp

405 410 415

Arg Tyr Gly Phe Pro Arg Gly Thr Ala Arg Arg Ala Lys Arg Val Ala

420 425 430

Gly Phe Gln Thr Gly Asp Leu Val Arg Leu Val Cys Leu Arg Gly Lys

435 440 445

Cys Ala Gly Val His Thr Gly Arg Leu Ser Ser Ile Arg Thr Arg Gly

450 455 460

Gln Phe Val Leu Gly Lys His Asp Arg Pro Ala Arg Glu Phe Thr Leu

465 470 475 480

Leu Gln Arg Ser Asp Gly Tyr Ala Tyr Gly

485 490

<210> 139

<211> 489

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-115 effector

<400> 139

Met Thr Ile Val Tyr Val Gln Asn Lys Asp Gly Lys Pro Leu Met Pro
1 5 10 15

Thr Thr Arg Tyr Cys Tyr Val Arg Leu Leu Leu Lys Glu Lys Lys Ala
20 25 30

Arg Val Val Ser Lys Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr
35 40 45

Pro Asp Val Thr Gln Asp Leu Ile Leu Gly Val Asp Pro Gly Arg Thr
50 55 60

Asn Ile Gly Val Ala Val Val Lys Lys Asp Gly Ser Cys Val Phe Ser
65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Asp Val Pro Leu Leu Met Lys Lys
85 90 95

Arg Ala Ala Phe Arg Lys Asn His Arg Thr Leu Asp Arg Arg Arg Lys
100 105 110

Arg Gln Arg Arg Ala Ile Ala Ala Gly Thr Ile Val Glu Ser Asn Thr
115 120 125

Ile Glu Lys Leu Leu Pro Gly Tyr Glu Lys Pro Val Val Cys His Tyr
130 135 140

Ile Arg Asn Lys Glu Ala Arg Phe Asn Asn Arg Ser Arg Pro Ala Gly
145 150 155 160

Trp Leu Thr Pro Thr Ala Asn His Leu Leu Gln Thr His Ile Asn Leu
165 170 175

Ile Ala Lys Val Thr Lys Phe Leu Pro Ile Thr Lys Val Val Val Glu
180 185 190

Leu Asn Arg Phe Ala Phe Met Ala Met Asp Asn Pro Asn Ile Arg Arg

195 200 205

Trp Glu Tyr Gln Gln Gly Pro Leu Tyr Gly Leu Gly Ser Val Glu Asp

210 215 220

Ala Val Tyr Ala Gln Gln Asp Gly His Cys Leu Phe Cys Lys Lys Pro

225 230 235 240

Ile Asp His Tyr His His Val Val Pro Arg His Lys Gly Gly Ser Glu

245 250 255

Thr Leu Val Asn Arg Cys Gly Leu Cys Ala Lys His His Asp Leu Val

260 265 270

His Lys Asp Lys Ala Trp Ala Glu Lys Leu Val Thr Arg Lys Gly Gly

275 280 285

Met Asn Lys Lys Tyr His Ala Leu Ser Ala Leu Asn Gln Ile Ile Pro

290 295 300

His Leu Met Glu Tyr Leu Gly Ser Glu Thr Pro Tyr Asp Val Tyr Ala

305 310 315 320

Thr Asp Gly Lys Ser Thr Lys Gly Phe Arg Ile Ala Lys Asn Val Pro

325 330 335

Lys Glu His Tyr Thr Asp Ala Tyr Cys Ile Ala Cys Ser Ile Leu Asp

340 345 350

Ala Asp Thr Lys Val Ser Ala Pro Ala Glu Pro Phe Lys Leu Lys Gln

355 360 365

Phe Arg Arg His Asp Arg Gln Ser Cys Ile Arg Gln Met Val Asp Arg

370 375 380

Lys Tyr Leu Leu Asp Gly Lys Val Val Ala Thr Asn Arg His Lys Ala

385 390 395 400

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

405 410 415

Asp Ala Ala Val Ser Gln Leu Thr Val Arg Pro His Leu Pro Gln Tyr

420 425 430

Lys Asp Met Thr Arg Ile Met Pro Gly Ala Val Met Ala Phe Asn Gly

435 440 445

Ser Val Gly Val Met Gln Ser Ser Ile Val Gly Ser Phe Tyr Lys Ser

450 455 460

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

465 470 475 480

Asn Ala Gly Met Val Phe Asn Pro Ala

485

<210> 140

<211> 41

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-116 effector

<400> 140

Met Thr Lys Val Tyr Val Gln Asn Lys Asp Gly Lys Pro Leu Met Pro

1 5 10 15

Thr Thr Arg Tyr Cys Tyr Val Arg Leu Leu Leu Lys Glu Lys Lys Ala

20 25 30

Arg Val Val Cys Thr Thr Pro Phe Thr

35 40

<210> 141

<211> 241

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-117 effector

<400> 141

Met Thr Lys Val Tyr Val Gln Asn Lys Asp Gly Lys Pro Leu Met Pro

1 5 10 15

Thr Thr Arg Tyr Cys Tyr Val Arg Leu Leu Leu Lys Glu Lys Lys Ala

20 25 30

Arg Val Val Ser Thr Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr

35 40 45

Pro Asp Ile Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr

50 55 60

Asn Ile Gly Val Ala Val Val Lys Glu Asp Gly Gln Cys Val Phe Ser

65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Asp Val Pro Leu Leu Met Gln Lys

85 90 95

Arg Ala Gly Phe Arg Arg Gln His Arg Thr Leu Asp Arg Arg Arg Lys

100 105 110

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

115 120 125

Val Glu Arg Leu Leu Pro Gly Tyr Glu Lys Pro Ile Val Cys His Tyr

130 135 140

Ile Arg Asn Lys Lys Ala Arg Phe Asn Asn Arg Lys Arg Pro Gln Gly

145 150 155 160

Trp Leu Thr Pro Thr Ala Asn His Leu Leu Gln Thr His Ile Asn Leu

165 170 175

Ile Ala Lys Val Ala Lys Phe Leu Pro Ile Thr Lys Val Val Val Glu

180 185 190

Leu Asn Arg Phe Ala Phe Met Ala Met Asp Asn Pro Asn Ile His Arg

195 200 205

Trp Glu Tyr Gln Gln Gly Pro Leu Tyr Gly Leu Gly Ser Val Glu Asp

210 215 220

Ala Val Tyr Ala Gln Gln Asp Gly Arg Cys Leu Phe Cys Lys Lys Pro

225 230 235 240

Ile

<210> 142

<211> 263

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-118 effector

<400> 142

Met Thr Lys Val Tyr Val Gln Asn Lys Asp Gly Lys Pro Leu Met Pro
1 5 10 15

Thr Thr Arg Tyr Cys Tyr Val Arg Leu Leu Leu Lys Glu Lys Lys Ala
20 25 30

Arg Val Val Ser Thr Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr
35 40 45

Pro Asp Ile Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr
50 55 60

Asn Ile Gly Val Ala Val Val Lys Glu Asp Gly Gln Cys Val Phe Ser
65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Asp Val Pro Leu Leu Met Gln Lys
85 90 95

Arg Ala Gly Phe Arg Arg Gln His Arg Thr Leu Asp Arg Arg Arg Lys
100 105 110

Arg Gln Arg Arg Ala Lys Ala Ala Gly Thr Asn Ile Ala Ala Gly Ser
115 120 125

Val Glu Arg Leu Leu Pro Gly Tyr Glu Lys Pro Ile Val Cys His Tyr
130 135 140

Ile Arg Asn Lys Lys Ala Arg Phe Asn Asn Arg Lys Arg Pro Gln Gly
145 150 155 160

Trp Leu Thr Pro Thr Ala Asn His Leu Leu Gln Thr His Ile Asn Leu
165 170 175

Ile Ala Lys Val Ala Lys Phe Leu Pro Ile Thr Lys Val Val Val Glu
180 185 190

Leu Asn Arg Phe Ala Phe Met Ala Met Asp Asn Pro Asn Ile His Arg
195 200 205

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

<210> 143
<211> 494
<212> PRT
<213> Unknown
<220
><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-119 effector
<400> 143
Met Thr Lys Val Tyr Val Gln Asn Lys Asp Gly Lys Pro Leu Met Pro
1 5 10 15
Thr Thr Arg Tyr Cys Tyr Val Arg Leu Leu Leu Lys Glu Lys Lys Ala
20 25 30
Arg Val Val Ser Thr Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr
35 40 45

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

100 105 110

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

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

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

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

Thr Asp Ile Glu Val Ser Thr Pro Val Glu Pro Phe Glu Leu Lys Gln
355 360 365

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

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

<210> 144
<211> 23
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-120 effector
<400> 144
Met Thr Met Val Tyr Val Gln Asn Lys Asp Gly Lys Pro Leu Met Pro
1 5 10 15
Thr Thr Arg Tyr Cys Tyr Val
20
<210> 145

<211> 494

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-121 effector

<400> 145

Met Thr Met Val Tyr Val Gln Asn Lys Asp Gly Lys Pro Leu Met Pro
1 5 10 15

Thr Thr Arg Tyr Cys Tyr Val Arg Leu Leu Leu Lys Glu Lys Lys Ala
20 25 30

Arg Val Val Cys Thr Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr
35 40 45

Pro Asp Ile Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr

50 55 60

Asn Ile Gly Val Ala Val Val Lys Glu Asp Gly Gln Cys Val Phe Ser
65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Asp Val Pro Leu Leu Met Gln Lys
85 90 95

Arg Ala Gly Phe Arg Lys Gln His Arg Thr Leu Asp Arg Arg Arg Lys
100 105 110

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

115 120 125

Val Glu Arg Leu Leu Pro Gly Tyr Glu Lys Pro Ile Val Cys His His
130 135 140

Ile Arg Asn Lys Glu Ala Arg Phe Asn Asn Arg Cys Arg Pro Val Gly
145 150 155 160

Trp Leu Thr Pro Thr Ala Asn His Leu Leu Gln Thr His Ile Asn Leu
165 170 175

Ile Ala Lys Val Ala Lys Phe Leu Pro Ile Thr Lys Val Val Val Glu

180 185 190

Leu Asn Arg Phe Ala Phe Met Ala Met Asp Asn Pro Asn Ile Arg Arg

195 200 205

Trp Glu Tyr Gln Gln Gly Pro Leu Tyr Gly Leu Gly Ser Val Glu Asp

210 215 220

Ala Val Tyr Ala Gln Gln Asp Gly His Cys Leu Phe Cys Lys Lys Pro

225 230 235 240

Ile Asp His Tyr His His Val Val Pro Arg His Lys Gly Gly Ser Glu

245 250 255

Thr Leu Ala Asn Arg Cys Gly Leu Cys Ala Lys His His Asp Leu Val

260 265 270

His Thr Asp Lys Ala Trp Ala Glu Lys Leu Val Thr Arg Lys Gly Gly

275 280 285

Met Asn Lys Lys Tyr His Ala Leu Ser Val Leu Asn Gln Ile Ile Pro

290 295 300

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

305 310 315 320

Thr Asp Gly Arg Ser Thr Lys Gly Phe Arg Ile Ala Lys Asn Val Pro

325 330 335

Lys Glu His Tyr Thr Asp Ala Tyr Cys Ile Ala Cys Ser Ile Leu Asp

340 345 350

Thr Asp Ile Glu Val Ser Thr Pro Val Glu Pro Phe Glu Leu Lys Gln

355 360 365

Phe Arg Arg His Asp Arg Gln Ser Cys Ile Arg Gln Met Val Asp Arg

370 375 380

Lys Tyr Ile Leu Asp Gly Lys Val Val Ala Ala Asn Arg His Lys Ala

385 390 395 400

Phe Glu Gln Glu Ser Asp Ser Leu Gln Glu Phe Arg Glu Ala Tyr Gly

405 410 415

Asp Ala Ala Val Ser Gln Leu Thr Val Lys Pro His Ser Pro Gln Tyr

420 425 430

Lys Asp Met Ala Arg Ile Met Pro Gly Ala Val Met Asp Phe Gly Gly

435 440 445

Ala Val Gly Ile Phe Gln Gly Ser Glu Gly Phe His Asn Gly Lys Pro

450 455 460

Asp Tyr Tyr Lys Ser Thr Lys Gly Glu Arg Val Leu Thr Arg Arg Cys

465 470 475 480

Ala Leu Leu Ala Gln Asn Ala Gly Met Val Phe Ile Pro Ala

485 490

<210> 146

<211> 494

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-122 effector

<400> 146

Met Thr Met Val Tyr Val Gln Asn Lys Asp Gly Lys Pro Leu Met Pro

1 5 10 15

Thr Thr Arg Tyr Cys Tyr Val Arg Leu Leu Leu Lys Glu Lys Lys Ala

20 25 30

Arg Val Val Cys Thr Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr

35 40 45

Pro Asp Ile Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr

50 55 60

Asn Ile Gly Val Ala Val Val Lys Glu Asp Gly Ser Cys Val Phe Ser

65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Asp Val Pro Leu Leu Met Gln Lys

85 90 95

Arg Ala Ala Phe Arg Arg Asn His Arg Thr Leu Asp Arg Arg Arg Lys

100 105 110

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

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

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

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

355 360 365

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

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

<210> 147
<211> 489
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-123 effector
<400> 147
Met Thr Met Val Tyr Val Gln Asn Lys Asp Gly Lys Pro Leu Met Pro
1 5 10 15
Thr Thr Arg Tyr Cys Tyr Val Arg Leu Leu Leu Lys Glu Lys Lys Ala
20 25 30
Arg Val Val Cys Thr Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr

35 40 45

Pro Asp Val Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Ile Thr

50 55 60

Asn Ile Gly Val Ala Val Val Lys Glu Asp Gly Ser Cys Val Phe Ser

65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Glu Val Pro Leu Leu Met Lys Lys

85 90 95

Arg Ala Ala Phe Arg Arg Gln His Arg Thr Gln Asp Arg Arg Arg Lys

100 105 110

Arg Gln Arg Arg Ala Ile Ala Ala Gly Thr Thr Val Glu Ser Asn Thr

115 120 125

Ile Glu Arg Leu Leu Pro Gly Tyr Glu Lys Pro Val Val Cys His Tyr

130 135 140

Ile Arg Asn Lys Glu Ala Arg Phe Asn Asn Arg Ser Arg Pro Val Gly

145 150 155 160

Trp Leu Thr Pro Thr Ala Asn His Leu Leu Gln Thr His Ile Asn Leu

165 170 175

Ile Ala Lys Ile Ala Lys Phe Leu Pro Ile Thr Lys Val Val Val Glu

180 185 190

Leu Asn Arg Phe Ala Phe Met Ala Met Asp Asn Pro Asn Ile His Arg

195 200 205

Trp Glu Tyr Gln Gln Gly Pro Leu Tyr Gly Leu Gly Ser Val Glu Asp

210 215 220

Ala Val Tyr Ala Gln Gln Asp Gly His Cys Leu Phe Cys Lys Lys Pro

225 230 235 240

Ile Asp His Tyr His His Val Val Pro Arg His Lys Gly Gly Ser Glu

245 250 255

Thr Leu Ala Asn Arg Cys Gly Leu Cys Glu Arg His His Ala Leu Val

260 265 270

His Lys Asp Lys Ala Trp Ala Glu Lys Leu Val Thr Arg Lys Gly Gly

275 280 285

Met Asn Lys Lys Tyr His Ala Leu Ser Val Leu Asn Gln Ile Ile Pro

290 295 300

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

355 360 365

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

420 425 430

Lys Asp Met Thr Arg Ile Met Pro Gly Ala Val Met Asp Phe Asn Gly
435 440 445
Thr Ile Gly Val Met Gln Ser Ser Ile Val Gly Arg Phe Tyr Lys Ser
450 455 460
Thr Lys Gly Tyr Lys Ala Thr Pro Arg Arg Cys Val Leu Leu Ala Gln
465 470 475 480
Asn Ala Gly Met Val Phe Leu Pro Ala
485

<210> 148
<211> 489
<212> PRT
<213> Unknown
<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-124 effector

<400> 148

Met Thr Met Val Tyr Val Gln Asn Lys Asp Gly Lys Pro Leu Met Pro
1 5 10 15

Thr Thr Arg Tyr Cys Tyr Val Arg Leu Leu Leu Lys Glu Lys Lys Ala
20 25 30

Arg Val Val Cys Thr Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr
35 40 45

Pro Asp Val Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr
50 55 60

Asn Ile Gly Val Ala Val Val Lys Glu Asp Gly Ser Cys Val Phe Ser
65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Glu Val Pro Leu Leu Met Lys Lys
85 90 95

Arg Ala Ala Phe Arg Arg Gln His Arg Thr Gln Asp Arg Arg Arg Lys
100 105 110

Arg Gln Arg Arg Ala Ile Ala Ala Gly Thr Thr Val Glu Ser Asn Thr
115 120 125

Ile Glu Arg Leu Leu Pro Gly Tyr Glu Lys Pro Val Val Cys His Tyr
130 135 140

Ile Arg Asn Lys Glu Ala Arg Phe Asn Asn Arg Ser Arg Pro Val Gly
145 150 155 160

Trp Leu Thr Pro Thr Ala Asn His Leu Leu Gln Thr His Ile Asn Leu
165 170 175

Ile Ala Lys Ile Ala Lys Phe Leu Pro Ile Thr Lys Val Val Val Glu
180 185 190

Leu Asn Arg Phe Ala Phe Met Ala Met Asp Asn Pro Asn Ile His Arg
195 200 205

Trp Glu Tyr Gln Gln Gly Pro Leu Tyr Gly Leu Gly Ser Val Glu Asp
210 215 220

Ala Val Tyr Ala Gln Gln Asp Gly His Cys Leu Phe Cys Lys Lys Pro

225 230 235 240

Ile Asp His Tyr His His Val Val Pro Arg His Lys Gly Gly Ser Glu

245 250 255

Thr Leu Ala Asn Arg Cys Gly Leu Cys Glu Arg His His Ala Leu Val

260 265 270

His Lys Asp Lys Ala Trp Ala Glu Lys Leu Val Thr Arg Lys Gly Gly

275 280 285

Met Asn Lys Lys Tyr His Ala Leu Ser Val Leu Asn Gln Ile Ile Pro

290 295 300

His Leu Met Glu Tyr Leu Gly Ser Glu Thr Pro Tyr Asp Val Tyr Ala

305 310 315 320

Thr Asp Gly Lys Ser Thr Lys Gly Phe Arg Ile Ala Lys Asn Val Pro

325 330 335

Lys Glu His Tyr Thr Asp Ala Tyr Cys Ile Ala Cys Ser Ile Leu Asp

340 345 350

Thr Asp Ile Glu Val Ser Ala Pro Thr Ser Pro Phe Gly Leu Lys Gln

355 360 365

Phe Arg Arg His Asp Arg Gln Thr Cys Ile Arg Gln Met Val Asp Arg

370 375 380

Lys Tyr Leu Leu Asp Gly Lys Val Ile Ala Thr Asn Arg His Lys Ala

385 390 395 400

Ile Glu Gln Lys Ser Asn Ser Leu Gln Glu Leu Arg Glu Ala Tyr Gly

405 410 415

Asp Ala Ala Val Ser Gln Leu Thr Val Lys Pro His Pro Pro Gln Tyr

420 425 430

Lys Asp Met Thr Arg Ile Met Pro Gly Ala Val Met Asp Phe Asn Gly

435 440 445

Thr Ile Gly Val Met Gln Ser Ser Ile Val Gly Arg Phe Tyr Lys Ser

450 455 460

Thr Lys Gly Tyr Lys Ala Thr Pro Arg Arg Cys Val Leu Leu Ala Gln

465 470 475 480

Asn Ala Gly Met Val Phe Leu Pro Ala

485

<210> 149

<211> 137

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-125 effector

<400> 149

Met Thr Met Val Tyr Val Gln Asn Lys Asp Gly Lys Pro Leu Met Pro

1 5 10 15

Thr Thr Arg Tyr Cys Tyr Val Arg Leu Leu Leu Lys Glu Lys Lys Ala

20 25 30

Arg Val Val Cys Thr Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr

35 40 45

Pro Asp Val Thr Gln Asp Leu Ile Leu Gly Val Asp Pro Gly Arg Thr

50 55 60

Asn Ile Gly Val Ala Val Val Lys Glu Asp Gly Ser Cys Val Phe Ser

65 70 75 80

Ala His Leu Glu Thr Arg Asn Asn Glu Val Pro Phe Leu Met Lys Lys

85 90 95

Arg Ala Gly Phe Arg Lys Gln His Arg Thr Leu Asp Arg Arg Arg Lys

100 105 110

Arg Gln Arg Arg Ala Lys Ala Ala Gly Thr Thr Ile Ala Glu Gly Ser

115 120 125

Val Glu Arg Leu Phe Pro Gly Tyr Lys

130 135

<210> 150

<211> 141

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-126 effector

<400> 150

Met Thr Met Val Tyr Val Gln Asn Lys Asp Gly Lys Pro Leu Met Pro

1 5 10 15

Thr Thr Arg Tyr Cys Tyr Val Arg Leu Leu Leu Lys Glu Lys Lys Ala

20 25 30

Arg Val Val Cys Thr Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr

35 40 45

Ser Asp Ile Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr

50 55 60

Asn Ile Gly Val Ala Val Val Lys Glu Asn Gly Gln Cys Val Phe Ser

65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Glu Val Pro Leu Leu Met Lys Lys

85 90 95

Arg Ala Ala Phe Arg Arg Asn His Arg Thr Leu Asp Arg Arg Arg Lys

100 105 110

Arg Gln Arg Arg Ala Lys Ala Ala Gly Thr Thr Ile Ala Glu Gly Ser

115 120 125

Val Glu Arg Leu Leu Pro Gly Tyr Ser Thr Pro Ile Val

130 135 140

<210> 151

<211> 494

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-127 effector

<400> 151

Met Thr Met Val Tyr Val Gln Asn Lys Asp Gly Lys Pro Leu Met Pro
1 5 10 15

Thr Thr Arg Tyr Cys Tyr Val Arg Leu Leu Leu Lys Glu Lys Lys Ala
20 25 30

Arg Val Val Cys Thr Thr Pro Phe Thr Ile Arg Leu Asn Tyr Asp Thr
35 40 45

Pro Asn Ile Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr
50 55 60

Asn Ile Gly Val Ala Val Val Lys Glu Asp Gly Ser Cys Val Phe Ser
65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Glu Val Pro Leu Leu Met Lys Lys
85 90 95

Arg Ala Ala Phe Arg Arg Gln His Arg Thr Gln Asp Arg Arg Arg Lys
100 105 110

Arg Gln Arg Arg Ala Ile Ala Ala Gly Thr Thr Val Glu Ser Asn Thr
115 120 125

Ile Glu Arg Leu Leu Pro Gly Tyr Glu Lys Pro Ile Val Cys His His
130 135 140

Ile Arg Asn Lys Glu Ala Arg Phe Asn Asn Arg Ser Arg Pro Ala Gly
145 150 155 160

Trp Leu Thr Pro Thr Ala Asn His Leu Leu Gln Ala His Ile Asn Leu
165 170 175

Ile Ala Lys Ala Ala Lys Phe Leu Pro Ile Thr Lys Val Val Val Glu
180 185 190

Leu Asn Arg Phe Ala Phe Met Ala Met Asp Asn Pro Asn Ile Arg Arg
195 200 205

Trp Glu Tyr Gln Gln Gly Pro Leu Tyr Gly Leu Gly Ser Val Lys Asp
210 215 220

Ala Val Tyr Ala Gln Gln Asp Gly His Cys Leu Phe Cys Lys Lys Pro

225 230 235 240

Ile Asp His Tyr His His Val Val Pro Arg His Lys Gly Gly Ser Glu

245 250 255

Thr Leu Ala Asn Arg Cys Gly Leu Cys Glu Lys His His Ala Leu Val

260 265 270

His Lys Asp Lys Ala Trp Ala Glu Lys Leu Val Thr Arg Lys Gly Gly

275 280 285

Met Asn Lys Lys Tyr His Ala Leu Ser Val Leu Asn Gln Ile Ile Pro

290 295 300

His Leu Met Glu Tyr Leu Gly Ser Glu Thr Pro Tyr Asp Val Tyr Ala

305 310 315 320

Thr Asp Gly Lys Ser Thr Lys Gly Phe Arg Ile Ala Lys Asn Val Pro

325 330 335

Lys Glu His Tyr Thr Asp Ala Tyr Cys Ile Ala Cys Ser Ile Leu Asp

340 345 350

Ala Asp Thr Lys Val Ser Ala Pro Ala Glu Pro Phe Lys Leu Lys Gln

355 360 365

Phe Arg Arg His Asp Arg Gln Ser Cys Ile Arg Gln Met Val Asp Arg

370 375 380

Lys Tyr Leu Leu Asp Gly Lys Val Val Ala Thr Asn Arg His Lys Ser

385 390 395 400

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

405 410 415

Asp Ala Ala Val Ser Gln Leu Thr Val Arg Pro His Ser Pro Gln Tyr

420 425 430

Lys Asp Met Ala Arg Ile Met Pro Gly Ala Val Met Asp Phe Asp Gly

435 440 445

Ile Val Gly Val Phe Lys Gly Ser Ser Gly Arg Asn Asn Gly Thr Pro

450 455 460

Asn Tyr Tyr Asn Ser Thr Lys Gly Ala Arg Val Leu Thr Lys Arg Cys

465 470 475 480

Ala Leu Leu Ala Lys Asn Ala Gly Met Val Phe Ile Pro Ala

485 490

<210> 152

<211> 494

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-128 effector

<400> 152

Met Thr Met Val Tyr Val Gln Asn Lys Asp Gly Lys Pro Leu Met Pro

1 5 10 15

Thr Thr Arg Tyr Cys Tyr Val Arg Leu Leu Leu Lys Glu Lys Lys Ala

20 25 30

Arg Val Val Cys Thr Thr Pro Phe Thr Ile Arg Leu Asn Tyr Asp Thr

35 40 45

Pro Asn Ile Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr

50 55 60

Asn Ile Gly Val Ala Val Val Lys Glu Asp Gly Ser Cys Val Phe Ser

65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Glu Val Pro Leu Leu Met Lys Lys

85 90 95

Arg Ala Ala Phe Arg Arg Gln His Arg Thr Gln Asp Arg Arg Arg Lys

100 105 110

Arg Gln Arg Arg Ala Ile Ala Ala Gly Thr Thr Val Glu Ser Asn Thr

115 120 125

Ile Glu Arg Leu Leu Pro Gly Tyr Glu Lys Pro Ile Val Cys His His

130 135 140

Ile Arg Asn Lys Glu Ala Arg Phe Asn Asn Arg Ser Arg Pro Ala Gly

145 150 155 160

Trp Leu Thr Pro Thr Ala Asn His Leu Leu Gln Ala His Ile Asn Leu

165 170 175

Ile Ala Lys Ala Ala Lys Phe Leu Pro Ile Thr Lys Val Val Val Glu

180 185 190

Leu Asn Arg Phe Ala Phe Met Ala Met Asp Asn Pro Asn Ile Arg Arg

195 200 205

Trp Glu Tyr Gln Gln Gly Pro Leu Tyr Gly Leu Gly Ser Val Lys Asp

210 215 220

Ala Val Tyr Ala Gln Gln Asp Gly His Cys Leu Phe Cys Lys Lys Pro

225 230 235 240

Ile Asp His Tyr His His Val Val Pro Arg His Lys Gly Gly Ser Glu

245 250 255

Thr Leu Ala Asn Arg Cys Gly Leu Cys Glu Lys His His Ala Leu Val

260 265 270

His Lys Asp Lys Ala Trp Ala Glu Lys Leu Val Thr Arg Lys Gly Gly

275 280 285

Met Asn Lys Lys Tyr His Ala Leu Ser Val Leu Asn Gln Ile Ile Pro

290 295 300

His Leu Met Glu Tyr Leu Gly Ser Glu Thr Pro Tyr Asp Val Tyr Ala

305 310 315 320

Thr Asp Gly Lys Ser Thr Lys Gly Phe Arg Ile Ala Lys Asn Val Pro

325 330 335

Lys Glu His Tyr Thr Asp Ala Tyr Cys Ile Ala Cys Ser Ile Leu Asp

340 345 350

Ala Asp Thr Lys Val Ser Ala Pro Ala Glu Pro Phe Lys Leu Lys Gln

355 360 365

Phe Arg Arg His Asp Arg Gln Ser Cys Ile Arg Gln Met Val Asp Arg

370 375 380

Lys Tyr Leu Leu Asp Gly Lys Val Val Ala Thr Asn Arg His Lys Ser

385 390 395 400

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

405 410 415

Asp Ala Ala Val Ser Gln Leu Thr Val Arg Pro His Ser Pro Gln Tyr
420 425 430

Lys Asp Met Ala Arg Ile Met Pro Gly Ala Val Met Val Phe Asp Gly
435 440 445

Ala Val Gly Val Phe Lys Gly Ser Ser Gly Arg Asn Asn Gly Thr Pro
450 455 460

Asn Tyr Tyr Asn Ser Thr Lys Gly Ala Arg Val Leu Thr Lys Arg Cys

465 470 475 480

Ala Leu Leu Ala Lys Asn Ala Gly Met Val Phe Ile Pro Ala
485 490

<210> 153

<211> 484

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-129 effector

<400> 153

Met Thr Met Val Tyr Val Gln Asn Lys Asp Gly Lys Pro Leu Met Pro
1 5 10 15

Thr Thr Arg Tyr Cys Tyr Val Arg Leu Leu Leu Lys Glu Lys Lys Ala
20 25 30

Arg Val Val Ser Arg Thr Pro Phe Thr Ile Arg Leu Asn Tyr Asp Thr
35 40 45

Pro Asp Val Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr
50 55 60

Asn Ile Gly Val Ala Val Val Lys Glu Asp Gly Gln Cys Val Phe Ser
65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Glu Val Pro Leu Leu Met Lys Lys
85 90 95

Arg Ala Ala Phe Arg Arg Asn His Arg Thr Leu Asp Arg Arg Arg Lys

100 105 110

Arg Gln Arg Arg Ala Ile Ala Ala Gly Thr Thr Val Glu Ser Asn Thr

115 120 125

Ile Glu Arg Leu Leu Pro Gly Tyr Glu Lys Pro Val Val Cys His Tyr

130 135 140

Val Arg Asn Lys Glu Ala Arg Phe Asn Asn Arg Cys Arg Pro Gln Gly

145 150 155 160

Trp Leu Thr Pro Thr Ala Asn His Leu Leu Gln Thr His Ile Asn Leu

165 170 175

Ile Ala Lys Ile Ala Lys Phe Leu Pro Ile Thr Lys Val Val Val Glu

180 185 190

Leu Asn Arg Phe Ala Phe Met Ala Met Asp Asn Pro Asn Ile His Arg

195 200 205

Trp Glu Tyr Gln Gln Gly Pro Leu Tyr Gly Leu Gly Ser Val Glu Asp

210 215 220

Ala Val Tyr Ala Gln Gln Asp Gly His Cys Leu Phe Cys Lys Lys Pro

225 230 235 240

Ile Asp His Tyr His His Val Val Pro Arg His Lys Gly Gly Ser Glu

245 250 255

Thr Leu Ala Asn Arg Cys Gly Leu Cys Glu Lys His His Ala Leu Val

260 265 270

His Lys Asp Lys Ala Trp Ala Glu Lys Leu Val Thr Arg Lys Gly Gly

275 280 285

Met Asn Lys Lys Tyr His Ala Leu Ser Val Leu Asn Gln Ile Ile Pro

290 295 300

His Leu Met Glu Tyr Leu Gly Arg Glu Thr Pro Tyr Asp Val Tyr Ala

305 310 315 320

Thr Asp Gly Arg Ser Thr Lys Gly Phe Arg Ile Ala Lys Asn Val Pro

325 330 335

Lys Glu His Tyr Thr Asp Ala Tyr Cys Ile Ala Cys Ser Ile Leu Asp

340 345 350

Ala Asp Thr Lys Val Ser Thr Pro Val Glu Pro Phe Glu Leu Lys Gln
355 360 365

Phe Arg Arg His Asp Arg Gln Ser Cys Ile Arg Gln Met Val Asp Arg
370 375 380

Lys Tyr Leu Leu Asp Gly Lys Val Val Ala Ala Asn Arg His Lys Ser
385 390 395 400

Ile Glu Gln Lys Ser Asp Ser Leu Glu Glu Phe Cys Glu Ala Tyr Gly
405 410 415

Asp Ala Ala Val Ser Gln Ile Thr Val Arg Pro His Ser Pro Gln Tyr
420 425 430

Lys Asp Met Ala Arg Ile Met Pro Gly Ala Val Met Asp Phe Asp Gly
435 440 445

Ile Val Gly Val Phe Lys Gly Ser Ser Gly Arg Asn Asn Gly Thr Pro
450 455 460

Asn Tyr Tyr Asn Ser Thr Lys Gly Ala Ser Val Leu Thr Asn Arg Cys
465 470 475 480

Ala Leu Leu Ala

<210> 154

<211> 489

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-130 effector

<400> 154

Met Thr Met Val Tyr Val Gln Asn Lys Asp Gly Lys Pro Leu Met Pro
1 5 10 15

Thr Thr Arg Tyr Cys Tyr Val Arg Leu Leu Leu Lys Glu Asn Lys Ala
20 25 30

Arg Val Val Ser Ser Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr

35 40 45

Pro Asp Val Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr

50 55 60

Asn Ile Gly Val Ala Val Val Lys Glu Asp Gly Gln Cys Val Phe Ser

65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Asp Val Pro Leu Leu Met Lys Lys

85 90 95

Arg Ala Ala Phe Arg Arg Asn His Arg Thr Leu Gly Arg Arg Arg Lys

100 105 110

Arg Gln Arg Arg Ala Lys Ala Ala Gly Thr Thr Val Glu Asn Glu Ser

115 120 125

Ile Lys Arg Leu Leu Pro Gly Tyr Glu Lys Pro Val Ile Cys His His

130 135 140

Ile Arg Asn Arg Lys Ala Arg Phe Asn Asn Arg Cys Arg Pro Gln Gly

145 150 155 160

Trp Leu Thr Pro Thr Ala Asn His Leu Leu Gln Thr His Ile Asn Leu

165 170 175

Ile Ala Lys Val Glu Lys Phe Leu Pro Ile Thr Thr Val Val Val Glu

180 185 190

Leu Asn Arg Phe Ala Phe Met Ala Met Asp Asn Pro Asn Ile Arg Arg

195 200 205

Trp Glu Cys Gln Gln Gly Pro Leu Tyr Gly Leu Gly Ser Val Glu Asp

210 215 220

Ala Val Tyr Ser Gln Gln Asp Gly His Cys Leu Phe Cys Lys Lys Pro

225 230 235 240

Ile Asp His Tyr His His Val Val Pro Arg His Lys Gly Gly Ser Glu

245 250 255

Thr Leu Ala Asn Arg Cys Gly Leu Cys Val Lys His His Asp Leu Val

260 265 270

His Lys Asp Lys Ala Trp Ala Asp Lys Leu Val Thr Arg Lys Glu Gly

275 280 285

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

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

Ile Glu Gln Lys Ser Asp Ser Leu Gln Glu Phe Arg Glu Ala Tyr Gly
405 410 415
Asp Ala Val Val Ser Gln Leu Ala Val Lys Pro His Leu Pro Gln Tyr
420 425 430
Lys Asp Met Thr Arg Ile Met Pro Gly Ala Met Met Asp Phe Asn Gly
435 440 445
Thr Ile Gly Val Met Gln Ser Ser Ile Val Gly Ser Phe Tyr Lys Ser
450 455 460

Thr Lys Gly His Lys Ala Thr Pro Lys Asn Cys Val Leu Leu Ala Gln
465 470 475 480
Asn Ala Gly Met Val Phe Ile Pro Ala
485

<210> 155
<211> 124
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-131 effector

<400> 155

Met Val Gln Ala Ser Ala Ala Gly Asn Lys Pro Phe His Asn Met Gly
1 5 10 15

Glu Gly Asp Ala Asp Lys Arg Pro Asn Thr Arg Ala Ser Gly Asp Tyr
20 25 30

Asp Thr Gly Leu Thr Arg Pro Ala Arg Ala Lys Ala Gly Arg Val Gln
35 40 45

Tyr Gly Phe Gln Thr Gly Asp Ile Val Arg Ala Ala Val Ser Thr Gly
50 55 60

Lys Lys Ala Gly Thr Tyr Ser Gly Arg Val Ala Val Arg Ser Ser Gly
65 70 75 80

Arg Phe Asp Ile Thr Thr Cys Thr Gly Lys Ala Gly Ser Asn Tyr Arg
85 90 95

Tyr Cys Thr His Leu His Lys Ser Asp Gly Tyr Ser Tyr Glu Lys Gly
100 105 110

Glu Ala Ala Ala Asn Phe Trp Phe Asp Ser Thr Arg
115 120

<210> 156

<211> 320

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-132 effector

<400> 156

Asn Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn Arg Thr Arg
1 5 10 15

Pro Asp Gly Trp Leu Ala Pro Ser Leu Gln His Arg Val Glu Thr Thr
20 25 30

Leu Thr Trp Val His Lys Leu Ile Arg Phe Ala Pro Ile Ala Ser Ile

35 40 45

Val Gln Glu Leu Val Gln Phe Asp Leu Gln Leu Met Gln Asn Ala Glu

50 55 60

Ile Ser Gly Val Leu Tyr Gln Gln Gly Glu Leu Gln Gly Tyr Glu Val

65 70 75 80

Ser Glu Tyr Leu Leu Thr Lys Trp His Arg Gln Cys Ala Tyr Cys Ser

85 90 95

Val Glu Asn Val Pro Phe Glu Ile Glu His Val Gln Pro Lys Ser Arg

100 105 110

Gly Gly Ser Asp Arg Val Ser Asn Leu Thr Leu Ala Cys His Asp Cys

115 120 125

Asn Gln Lys Lys Gly Asn Gln Asp Val Arg Glu Phe Leu Ala Thr Lys

130 135 140

Pro His Leu Leu Asn Arg Ile Leu Lys Gln Ala Lys Leu Pro Leu Lys

145 150 155 160

Asp Ala Ala Ala Val Asn Ser Thr Arg Trp Ala Leu Phe Asn Ala Leu

165 170 175

Lys Glu Thr Gly Leu Pro Val Thr Thr Gly Thr Gly Gly Gln Thr Lys

180 185 190

Phe Asn Arg Asn Arg Leu Glu Leu Pro Lys Ser His Trp Leu Asp Ala

195 200 205

Ala Cys Val Gly Asn Phe Glu Ala Leu Glu Val Leu Thr Ser Lys Pro

210 215 220

Leu Leu Ile Ala Ala Lys Gly His Gly Thr Arg Gln Met Cys Gly Thr

225 230 235 240

Asn Lys Tyr Gly Phe Ala Thr Arg His Lys Ser Arg Val Gln Ile His

245 250 255

Asn Gly Phe Gln Thr Gly Asp Ile Val Ser Ala Thr Val Thr Ala Gly

260 265 270

Lys Lys Ile Gly Ser Tyr Val Gly Arg Val Leu Cys Arg Ala Ser Gly

275 280 285

Ser Phe Asp Ile Ala Thr Lys Ser Gly Arg Val Ala Gly Ile Ser His

290 295 300

Lys Tyr Cys Ser Pro Ile His Lys Lys Asp Gly Tyr Ser Tyr Ala Phe

305 310 315 320

<210> 157

<211> 341

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-133 effector

<400> 157

Asn Arg Ser Arg Pro Ala Gly Trp Leu Thr Pro Thr Ala Asn His Leu

1 5 10 15

Leu Gln Thr His Ile Ile Leu Ile Ala Lys Val Ala Lys Phe Leu Pro

20 25 30

Ile Thr Lys Val Val Val Glu Leu Asn Arg Phe Ala Phe Met Ala Met

35 40 45

Glu Asn Pro Asn Ile His Arg Trp Glu Tyr Gln Gln Gly Pro Leu Tyr

50 55 60

Gly Leu Gly Ser Val Glu Asp Ala Val Tyr Ala Gln Gln Asp Gly His

65 70 75 80

Cys Leu Phe Cys Lys Glu Pro Ile Asp His Tyr His His Val Val Pro

85 90 95

Arg His Lys Gly Gly Ser Glu Thr Leu Ala Asn Arg Cys Gly Leu Cys

100 105 110

Ala Lys His His Asp Leu Val His Lys Asp Lys Ala Trp Ala Glu Lys

115 120 125

Leu Val Thr Arg Lys Gly Gly Met Asn Lys Lys Tyr His Ala Leu Ser

130 135 140

Val Leu Asn Gln Ile Ile Pro His Leu Met Glu His Leu Gly Ser Glu
145 150 155 160

Thr Pro Tyr Asp Val Tyr Ala Thr Asp Gly Arg Ser Thr Lys Gly Phe
165 170 175
Arg Ile Ala Lys Asn Val Pro Lys Glu His Tyr Ala Asp Ala Tyr Cys
180 185 190
Ile Ala Cys Ser Ile Leu Asp Ser Asp Ile Glu Thr Ser Ala Pro Val
195 200 205
Glu Pro Phe Glu Leu Lys Gln Phe Arg Arg His Asp Arg Gln Ala Cys
210 215 220

Ile Arg Gln Met Val Asp Arg Lys Tyr Leu Leu Asp Gly Lys Val Val
225 230 235 240
Ala Ala Asn Arg His Lys Ala Ile Glu Gln Lys Ser Asp Ser Leu Gln
245 250 255
Glu Phe Arg Glu Ala Tyr Gly Asn Ala Ala Val Ser Leu Leu Thr Val
260 265 270
Lys Pro His Pro Pro Gln Tyr Lys Asp Met Thr Arg Ile Met Pro Gly
275 280 285

Ala Val Met Asp Phe Asn Gly Thr Val Gly Val Met Gln Cys Ser Ser
290 295 300
Gly Arg Asn Asn Gly Lys Val Asp Phe Phe Lys Ser Thr Lys Gly Asn
305 310 315 320
Lys Thr Thr Pro Arg Cys Cys Thr Phe Leu Ala Gln Asn Ala Gly Met
325 330 335
Val Phe Ile Pro Ala
340

<210> 158
<211> 310
<212> PRT
<213> Unknown
<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-134 effector

<400> 158

Pro Ser Leu Val Ser Lys Ala Glu Asn Ile Leu Asn Trp Val Ile Arg
1 5 10 15

Phe Ala Lys Leu Thr Pro Leu Thr Lys Phe Ala Leu Glu Thr Ala Lys
20 25 30

Phe Asp Met Gln Lys Leu Glu Asn Pro Asp Thr Gln Gly Val Gly Tyr
35 40 45

Gln Gln Gly Arg Met Phe Gly Tyr Ala Asp Lys Lys Ala Tyr Leu Leu
50 55 60

Glu Arg Glu Asn Tyr Thr Cys Ile Tyr Cys Gly Ile His Ala Ser Lys
65 70 75 80

Ala Lys Met Glu Ile Glu His Val Ile Pro Arg Ser Arg Gly Gly Thr
85 90 95

Asp Ser Leu Asn Asn Leu Val Leu Ser Cys Arg Ala Cys Asn Glu Ala
100 105 110

Lys Gly Ser Gln Asp Val Gln Thr Tyr Leu Lys Gly Asn Pro Ser Val
115 120 125

Leu Arg Arg Val Lys Ala Arg Leu Asn Thr Asn Tyr Arg Asp Ala Ala
130 135 140

His Thr Asn Ser Ile Arg Leu Phe Val Leu Asn Lys Leu Gln Thr Met
145 150 155 160

Ala Asp Ala Ile Gly Thr Asn Leu Asn Val Gly Phe Gly Tyr Thr Thr
165 170 175

Lys Gln Asn Arg Leu Leu Leu Asn Leu Pro Lys Asp His Trp Ile Asp
180 185 190

Ala Ala Val Cys Thr Ser Asp Gly Ser Ala Val Lys Val Asp Pro Ser
195 200 205

Leu Lys Pro Phe Thr Ile Lys Ala Ile Gly Arg Gly Ser Arg Gln Phe
210 215 220

Cys Arg Met Asn Lys Tyr Gly Phe Pro Arg Thr Ser Pro Lys Pro Arg
225 230 235 240

Ser Lys Asn Phe Phe Gly Phe Lys Thr Gly Asp Met Val Lys Val Val
245 250 255

Val Pro Leu Gly Ser Lys Thr Lys Val Pro Val Gly Thr His Thr Gly
260 265 270

Arg Val Ala Val Arg Ser Ser Gly Ser Phe Asp Val Lys Thr Arg Asp
275 280 285

Ala Lys Leu Gly Ile Tyr His Lys Tyr Cys Gln Gln Ile His Leu Met
290 295 300

Asp Gly Tyr Ser Tyr Ala
305 310

<210> 159

<211> 278

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-135 effector

<400> 159

Gln Glu Leu Val Lys Phe Asp Thr Gln Ala Leu Gln Ser Pro Glu Ile
1 5 10 15

Arg Gly Val Glu Tyr Gln Gln Gly Thr Leu Phe Gly Tyr Glu Val Arg
20 25 30

Glu Tyr Leu Leu Glu Lys Trp His Arg Arg Cys Ala Tyr Cys Ala Ala
35 40 45

Thr Asp Val Pro Leu Gln Val Glu His Ile Val Pro Lys Ser Lys Gly
50 55 60

Gly Ser Asn Arg Ile Ser Asn Leu Cys Leu Ser Cys Ala Asp Cys Asn
65 70 75 80

Gln Lys Lys Gly Val Leu Pro Val Glu Val Phe Leu Ala Ser Gln Pro

85 90 95

Asp Arg Leu Asn Arg Ile Leu Ala Gln Ala Lys Ala Pro Leu Lys Asp
100 105 110
Ala Ala Ala Val Asn Ser Thr Arg Trp Ala Leu Phe Gln Arg Leu Lys
115 120 125
Ala Thr Gly Leu Pro Val Glu Val Gly Thr Gly Gly Arg Thr Lys Phe
130 135 140
Asn Arg Thr Arg Leu Ser Leu Pro Lys Thr His Ala Leu Asp Ala Ala
145 150 155 160

Cys Val Gly Asp Val Asp Ala Ile Glu Gly Trp Gln Val Pro Thr Leu
165 170 175
Arg Val Lys Ala Thr Gly Arg Gly Thr Tyr Gln Arg Thr Arg Leu Thr
180 185 190
Ala Gln Gly Phe Pro Arg Gly Ser Leu Thr Arg Ala Lys Arg His Phe
195 200 205
Gly Phe Gln Thr Gly Asp Gln Val Lys Ala Val Val Pro Ala Gly Lys
210 215 220

Lys Ala Gly Thr His Val Gly Arg Val Ala Val Arg Ala Ser Gly Ser
225 230 235 240
Phe Asn Ile Gln Thr Pro His Gly Val Val Gln Gly Ile His His Arg
245 250 255
His Cys His Leu Leu Gln Arg Gly Asp Gly Tyr Gly Tyr Ala Ile Ser
260 265 270
Thr Phe Asp Ser Thr His
275

<210> 160
<211> 60
<212> PRT
<213> Unknown
<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-136 effector

<400> 160

Gln Thr Gly Asp Ile Val Lys Ala Val Val Thr Lys Gly Lys Asn Ile
1 5 10 15

Gly Thr Tyr Ile Gly Arg Val Val Val Arg Ala Arg Gly Ser Phe Asp
20 25 30

Ile Gly Ile Gly Lys Lys Lys Val Ser Gly Ile Ser Tyr Lys Tyr Cys
35 40 45

Gln Leu Ile Gln Arg Val Asp Gly Tyr Glu Tyr Thr
50 55 60

<210> 161

<211> 217

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-137 effector

<400> 161

Gln Val Glu His Ile His Pro Lys Ala Lys Gly Gly Ser Asn Arg Ile
1 5 10 15

Ser Asn Leu Cys Leu Ala Cys Glu Lys Cys Asn Leu Lys Lys Gly Thr

20 25 30

Gln Asp Ile Lys Asn Phe Leu Ser Lys Lys Pro Asp Leu Leu Lys Gln
35 40 45

Ile Met Gly Gln Val Lys Arg Pro Leu Lys Asp Ala Ala Ala Val Asn
50 55 60

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

Val Thr Thr Gly Ser Gly Gly Gln Thr Lys Tyr Asn Arg Thr Arg Leu

85 90 95

Lys Leu Pro Lys Thr His Tyr Phe Asp Ala Ala Cys Val Gly Arg Val
100 105 110
Asp Gln Leu Ile Val Leu Thr Thr Gln Pro Leu Leu Ile Lys Ser Arg
115 120 125
Gly His Gly Thr Arg Gln Met Cys Arg Thr Asp Lys Phe Gly Phe Pro
130 135 140
Ser Arg His Val Pro Arg Asn Lys Leu Val Lys Gly Phe Gln Thr Gly

145 150 155 160
Asp Ile Val Lys Ala Val Val Thr Ser Gly Lys Lys Val Gly Glu Tyr
165 170 175
Val Gly Arg Val Ala Val Arg Ser Asn Gly Ser Phe Asn Ile Ser Ala
180 185 190
Lys Glu Leu Val Gln Ser Ile Ser His Lys Tyr Cys Gln Thr Leu Gln
195 200 205
Arg Lys Asp Gly Tyr Ser Tyr Gln Phe
210 215

<210> 162
<211> 124
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-138 effector
<400> 162
Arg Leu Asp Leu Pro Lys Thr His Trp Leu Asp Ala Ala Cys Val Gly
1 5 10 15
His Val Asp Gln Leu Glu Val Leu Thr Gly Lys Pro Leu Leu Ile Lys
20 25 30
Ala Thr Gly His Gly Ser Arg Gln Met Cys Gly Thr Asp Lys Phe Gly

35 40 45
Phe Pro Ser Arg His Arg Thr Arg Lys Gln Ile His Gln Gly Phe Gln

50 55 60

Thr Gly Asp Ile Val Lys Ala Leu Val Thr Ser Gly Lys Lys Ile Gly
65 70 75 80

Ser Tyr Gly Gly Arg Val Leu Cys Arg Ala Ser Gly Ser Phe Asp Ile
85 90 95

Gln Val Lys Ser Gly Arg Val Gln Gly Leu Ser His Lys Phe Cys Arg

100 105 110

Ser Val His Arg Lys Asp Gly Tyr Gly Tyr Gly Phe
115 120

<210> 163

<211> 125

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-139 effector

<400> 163

Arg Leu Arg Phe Asn Leu Pro Lys Ala His Trp Leu Asp Ala Ala Cys
1 5 10 15

Val Gly Asp Val Glu Ser Leu Asp Ile Val Thr Ser Lys Pro Leu Met
20 25 30

Ile Arg Ala Lys Gly His Gly Thr Arg Arg Met Cys Gly Thr Asn Lys
35 40 45

Tyr Gly Phe Pro Thr Arg His Arg Ser Arg Arg Gln Ile His Asn Gly
50 55 60

Phe Gln Thr Gly Asp Ile Val Thr Ala Thr Val Thr Ala Gly Lys Lys
65 70 75 80

Ile Gly Ser Tyr Val Gly Arg Val Leu Cys Arg Ala Ser Gly Ser Phe
85 90 95

Asp Ile Thr Thr Ala Ser Gly Arg Val Thr Gly Ile Asn His Lys Tyr
100 105 110

Cys Lys Pro Ile His Arg Lys Asp Gly Tyr Ala Tyr Ala

115 120 125

<210> 164

<211> 171

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-140 effector

<400> 164

Arg Thr Arg Asp Lys Gly Trp Leu Ala Pro Ser Leu Lys Ser Arg Val

1 5 10 15

Glu Asn Ile Leu Thr Trp Val Asn Arg Leu Arg Arg Val Ser Asn Ile

20 25 30

Thr Ala Ile Ser Gln Glu Leu Val Arg Phe Asp Thr Gln Lys Leu Gln

35 40 45

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

50 55 60

Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys Trp Gly Arg Lys Cys Ala

65 70 75 80

Tyr Cys Gly Ala Lys Asp Val Pro Leu Gln Val Glu His Ile Val Pro

85 90 95

Arg Ser Lys Gly Gly Ser Asn Arg Val Ser Asn Leu Thr Leu Ala Cys

100 105 110

Val Ser Cys Asn Gln Ala Lys Gly Asn Gln Asp Ile Arg Glu Phe Leu

115 120 125

Lys His Lys Pro Asp Leu Leu Ser Arg Ile Leu Gln Gln Thr Lys Gln

130 135 140

Pro Leu Val Ala Ala Ala Val Val Asn Thr Thr Arg Trp Ala Leu Phe

145 150 155 160

Asn Arg Leu Lys Glu Thr Gly Leu Pro Val Asp

165 170

<210> 165

<211> 294

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-141 effector

<400> 165

Arg Val Glu Asn Ile Leu Thr Trp Val Asn Arg Leu Arg Arg Val Ser
1 5 10 15

Asn Ile Thr Ala Ile Ser Gln Glu Leu Val Arg Phe Asp Thr Gln Lys
20 25 30

Leu Gln Asn Pro Glu Ile Ser Gly Glu Glu Tyr Gln Gln Gly Thr Leu
35 40 45

Tyr Gln Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys Trp Gly Arg Lys
50 55 60

Cys Ala Tyr Cys Gly Ala Lys Asp Val Pro Leu Gln Val Glu His Ile
65 70 75 80

Val Pro Arg Ser Lys Gly Gly Ser Asn Arg Val Ser Asn Leu Thr Leu
85 90 95

Ala Cys Val Ser Cys Asn Gln Ala Lys Gly Asn Gln Asp Ile Arg Glu
100 105 110

Phe Leu Lys His Lys Pro Glu Leu Leu Ser Arg Ile Leu Gln Gln Thr
115 120 125

Lys Gln Pro Leu Val Val Ala Ala Val Val Asn Thr Ala Arg Trp Val
130 135 140

Leu Phe Asn Arg Leu Lys Glu Thr Gly Leu Pro Val Glu Thr Gly Thr
145 150 155 160

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

165 170 175

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

Ala Val Val Thr Arg Gly Lys Lys Val Gly Lys Tyr Ile Gly Arg Val
245 250 255
Val Cys Arg Ala Ser Gly Ser Phe Asp Ile Thr Thr Lys Gln Gly Arg
260 265 270
Ile Thr Gly Ile Ser Tyr Lys Tyr Cys Lys Thr Val His Lys Lys Asp
275 280 285
Gly Tyr Glu Tyr Ala Phe
290

<210> 166
<211> 110
<212> PRT
<213> Unknown
<220><223
> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-142 effector
<400> 166
Ser Ala Val Lys Val Asp Pro Ser Leu Lys Pro Leu Ile Ile Lys Ala
1 5 10 15
Val Gly Arg Gly Ser Arg Gln Phe Cys Arg Met Asp Lys Tyr Gly Phe
20 25 30
Pro Arg Thr Ser Pro Lys Pro Arg Ser Lys Asn Phe Phe Gly Phe Lys

35 40 45

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

<210> 167
<211> 413
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-143 effector
<400> 167
Ser Gly Arg Ala Ser Val Phe Arg Arg Phe Pro Phe Thr Ile Ile Leu
1 5 10 15
His Asp Arg Thr Val Glu Glu Ser Glu Leu Gln Asp Thr Glu Ile Lys
20 25 30
Ile Asp Gln Gly Ser Lys Thr Thr Gly Val Ala Leu Leu Val His Gly

35 40 45
Gln Asp Gly Thr Thr Val Ala Leu Ala Ala His Val Glu His Arg Thr
50 55 60
Asn Ile Lys Ser Asn Leu Asp Ser Arg Arg Ala Ile Arg Arg Ser Arg
65 70 75 80
Arg His Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn Arg Thr
85 90 95
Arg Pro Lys Gly Trp Leu Pro Pro Ser Leu Val Ser Lys Ala Glu Asn

100 105 110

Ile Leu Asn Trp Val Ile Arg Phe Thr Lys Leu Thr Pro Phe Thr Lys

115 120 125

Phe Ala Leu Glu Thr Ala Lys Phe Asp Met Gln Lys Leu Glu Asn Pro

130 135 140

Asp Thr Gln Gly Val Gly Tyr Gln Gln Gly Arg Met Phe Gly Tyr Ala

145 150 155 160

Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu Asn Tyr Thr Cys Ile Tyr

165 170 175

Cys Gly Ile His Ala Ser Lys Ala Lys Met Glu Ile Glu His Val Ile

180 185 190

Pro Arg Ser Arg Gly Gly Thr Asp Ser Leu Asn Asn Leu Val Leu Ser

195 200 205

Cys His Glu Cys Asn Gln Ala Lys Ser Ser Gln Asp Val Gln Thr Tyr

210 215 220

Leu Lys Gly Arg Pro Ser Val Leu Gln Arg Val Lys Ala Arg Leu Asn

225 230 235 240

Thr Asn Tyr Arg Asp Ala Ala His Thr Asn Ser Ile Arg Leu Tyr Met

245 250 255

Ile Asp Lys Leu Ser Ala Ile Ala Thr Thr Ile Gly Ala Thr Leu Lys

260 265 270

Val Gly Phe Gly Tyr Thr Thr Lys Gln Asn Arg Leu Ser Leu Gly Leu

275 280 285

Pro Lys Asp His Trp Ile Asp Ala Ala Val Cys Thr Ser Asp Gly Ser

290 295 300

Ala Val Lys Val Asp Pro Ser Leu Lys Pro Leu Ile Ile Lys Ala Val

305 310 315 320

Gly Arg Gly Ser Arg Gln Phe Cys Arg Val Asp Lys Tyr Gly Phe Pro

325 330 335

Arg Thr Ser Pro Lys Pro Arg Ser Lys Asn Phe Phe Gly Phe Lys Thr

340 345 350

Gly Asp Met Val Lys Val Val Ile Pro Asp Asn Ala Lys Thr Lys Val

355 360 365

Pro Ala Gly Thr Tyr Ile Gly Arg Val Ala Val Arg Ser Ser Gly Ser

370 375 380

Phe Asp Val Lys Thr Gly Asp Ala Lys Ile Thr Val Ser His Lys Tyr

385 390 395 400

Cys Gln Pro Ile Tyr Leu Met Asp Gly Tyr Asn Tyr Val

405 410

<210> 168

<211> 43

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-144 effector

<400> 168

Ser Thr Val Tyr Val Leu Asn Lys Asp Gly Lys Pro Leu Met Pro Thr

1 5 10 15

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

20 25 30

Val Val Arg Asn Glu Pro Phe Thr Ile Glu Asp

35 40

<210> 169

<211> 114

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-146 effector

<400> 169

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

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

Tyr Ala

<210> 170
<211> 317
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-147 effector
<400> 170
Val Gly Phe Lys Gln Pro Asn Phe Asn Lys Val Leu Val Leu Asp Thr
1 5 10 15
Asn Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala Arg Ala Lys Lys Leu
20 25 30
Leu Asn Ser Gly Arg Ala Ser Val Phe Arg Arg Phe Pro Phe Thr Ile

35 40 45
Ile Leu His Asp Arg Thr Gly Glu Glu Ser Glu Leu Gln Asp Thr Glu

50 55 60

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

65 70 75 80

His Gly Gln Asp Gly Thr Thr Val Ala Leu Ala Ala His Val Glu His

85 90 95

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

100 105 110

Ser Arg Arg His Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn

115 120 125

Arg Thr Arg Pro Lys Gly Trp Leu Pro Pro Ser Leu Val Ser Lys Ala

130 135 140

Glu Asn Ile Leu Asn Trp Val Ile Arg Phe Thr Lys Leu Thr Pro Phe

145 150 155 160

Thr Lys Phe Ala Leu Glu Thr Ala Lys Phe Asp Met Gln Lys Leu Glu

165 170 175

Asn Pro Asp Thr Gln Gly Val Gly Tyr Gln Gln Gly Arg Met Phe Gly

180 185 190

Tyr Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu Asn Tyr Thr Cys

195 200 205

Ile Tyr Cys Gly Ile His Ala Ser Lys Ala Lys Met Glu Ile Glu His

210 215 220

Val Ile Pro Arg Ser Arg Gly Gly Thr Asp Ser Leu Asn Asn Leu Val

225 230 235 240

Leu Ser Cys Arg Ala Cys Asn Glu Ala Lys Gly Ser Gln Asp Val Gln

245 250 255

Thr Tyr Leu Lys Gly Asn Pro Ser Val Leu Arg Arg Val Lys Ala Arg

260 265 270

Leu Asn Thr Asn Tyr Arg Asp Ala Ala His Thr Asn Ser Ile Arg Leu

275 280 285

Phe Val Leu Asn Lys Leu Gln Thr Met Ala Asp Ala Ile Gly Thr Asn

290 295 300

Leu Asn Val Gly Phe Gly Tyr Thr Thr Lys Gln Asn Arg
305 310 315

<210> 171

<211> 447

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-148 effector

<400> 171

Val Gly Phe Lys Gln Pro Asn Phe Asn Lys Val Leu Val Leu Asp Thr
1 5 10 15

Asn Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala Arg Ala Lys Lys Leu
20 25 30

Leu Asn Ser Gly Arg Ala Ser Val Phe Arg Arg Phe Pro Phe Thr Ile
35 40 45

Ile Leu His Asp Arg Thr Val Glu Glu Ser Glu Leu Gln Asp Thr Glu
50 55 60

Ile Lys Ile Asp Gln Gly Ser Lys Thr Thr Gly Val Ala Leu Leu Val
65 70 75 80

His Gly Gln Asp Gly Thr Thr Val Ala Leu Ala Ala His Val Glu His
85 90 95

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

Ser Arg Arg Ser Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn
115 120 125

Arg Thr Arg Pro Lys Gly Trp Leu Pro Pro Ser Leu Val Ser Lys Ala
130 135 140

Glu Asn Ile Leu Asn Trp Val Ile Arg Phe Thr Lys Leu Thr Pro Phe
145 150 155 160

Thr Lys Phe Ala Leu Glu Thr Ala Lys Phe Asp Met Gln Lys Leu Glu

165 170 175

Asn Pro Asp Thr Gln Gly Val Gly Tyr Gln Gln Gly Arg Met Phe Gly

180 185 190

Tyr Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu Asn Tyr Thr Cys

195 200 205

Ile Tyr Cys Gly Ile His Ala Ser Lys Ala Lys Met Glu Ile Glu His

210 215 220

Val Ile Pro Arg Ser Arg Gly Gly Thr Asp Ser Leu Asn Asn Leu Val

225 230 235 240

Leu Ser Cys Arg Ala Cys Asn Glu Ala Lys Gly Ser Gln Asp Val Gln

245 250 255

Thr Tyr Leu Lys Gly Asn Pro Ser Val Leu Arg Arg Val Lys Ala Arg

260 265 270

Leu Ser Thr Asn Tyr Arg Asp Ala Ala His Thr Asn Ser Ile Arg Leu

275 280 285

Phe Val Leu Asn Lys Leu Gln Thr Met Ala Asp Ala Ile Gly Thr Asn

290 295 300

Leu Asn Val Gly Phe Gly Tyr Thr Thr Lys Gln Asn Arg Leu Leu Leu

305 310 315 320

Asn Leu Pro Lys Asp His Trp Ile Asp Ala Ala Val Cys Thr Ser Asp

325 330 335

Gly Ser Ala Val Lys Val Asp Pro Ser Leu Lys Pro Leu Thr Ile Lys

340 345 350

Ala Ile Gly Arg Gly Ser Arg Gln Phe Cys Arg Met Asn Lys Tyr Gly

355 360 365

Phe Pro Arg Thr Ser Pro Lys Pro Arg Ser Lys Asn Phe Phe Gly Phe

370 375 380

Lys Thr Gly Asp Met Val Lys Val Val Val Pro Leu Gly Ser Lys Thr

385 390 395 400

Lys Val Pro Val Gly Thr His Thr Gly Arg Val Ala Val Arg Ser Ser

405 410 415

Gly Ser Phe Asp Val Lys Thr Arg Asp Ala Lys Leu Gly Ile Tyr His
420 425 430
Lys Tyr Cys Gln Gln Ile His Leu Met Asp Gly Tyr Ser Tyr Ala
435 440 445
<210> 172
<211> 361
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220
><223> Category: MG35 effectors
<220><223> Description: MG35-149 effector
<400> 172
Val Gly Phe Lys Gln Pro Asn Phe Asn Lys Val Leu Val Leu Asp Thr
1 5 10 15
Asn Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala Arg Ala Lys Lys Leu
20 25 30
Leu Asn Ser Gly Arg Ala Ser Val Phe Arg Arg Phe Pro Phe Thr Ile
35 40 45
Ile Leu His Asp Arg Thr Val Glu Glu Ser Glu Leu Gln Asp Thr Glu
50 55 60
Ile Lys Ile Asp Gln Gly Ser Lys Thr Thr Gly Val Ala Leu Leu Val
65 70 75 80
His Gly Gln Asp Gly Thr Thr Val Ala Leu Ala Ala His Val Glu His
85 90 95
Arg Thr Asn Ile Lys Ser Asn Leu Asp Ser Arg Arg Ala Ile Arg Arg
100 105 110
Ser Arg Arg His Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn
115 120 125
Arg Thr Lys Pro Lys Gly Trp Leu Pro Pro Ser Leu Val Ser Lys Ala
130 135 140
Glu Asn Ile Leu Asn Trp Val Ile Arg Phe Ala Lys Leu Thr Pro Leu

145 150 155 160

Thr Lys Phe Ala Leu Glu Thr Ala Lys Phe Asp Met Gln Lys Leu Val

165 170 175

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

180 185 190

Tyr Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu Gln Arg Cys Cys

195 200 205

Ile Tyr Cys Gly Ile His Ala Ser Lys Ala Lys Met Glu Ile Glu His

210 215 220

Val Ile Pro Arg Ser Arg Gly Gly Thr Asp Ser Leu Asn Asn Leu Val

225 230 235 240

Leu Ser Cys His Glu Cys Asn Gln Ala Lys Gly Asn Leu Ser Leu Ser

245 250 255

Glu Tyr Leu Lys Asp Lys Pro Ser Val Leu Lys Arg Val Lys Ala His

260 265 270

Leu Gly Ile Asn Tyr Arg Asp Ala Ala His Thr Asn Ser Ile Arg Leu

275 280 285

Tyr Val Met Asn Lys Leu Arg Ala Met Ala Glu Ala Ile Gly Ala Lys

290 295 300

Leu Val Val Gly Phe Gly Ser Thr Thr Lys Glu Asn Arg Leu Leu Leu

305 310 315 320

Asn Leu Pro Lys Asp His Trp Ile Asp Ala Ala Val Cys Thr Ser Asp

325 330 335

Gly Ser Ala Val Lys Val Asp Pro Ser Leu Lys Pro Leu Thr Ile Lys

340 345 350

Ala Ile Gly Arg Gly Ser Arg Gln Phe

355 360

<210> 173

<211> 447

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-150 effector

<400> 173

Val Gly Phe Lys Gln Pro Asn Phe Asn Lys Val Leu Val Leu Asp Thr
1 5 10 15

Asn Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala Arg Ala Lys Lys Leu
20 25 30

Leu Asn Ser Gly Arg Ala Ser Val Phe Arg Arg Phe Pro Phe Thr Ile
35 40 45

Ile Leu His Asp Arg Thr Val Glu Glu Ser Glu Leu Gln Asp Thr Glu

50 55 60

Ile Lys Ile Asp Gln Gly Ser Lys Thr Thr Gly Val Ala Leu Leu Val
65 70 75 80

His Gly Gln Asp Gly Thr Thr Val Ala Leu Ala Ala His Val Glu His
85 90 95

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

Ser Arg Arg His Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn

115 120 125

Arg Thr Arg Pro Lys Gly Trp Leu Pro Pro Pro Leu Val Ser Lys Ala
130 135 140

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

Thr Lys Phe Ala Leu Asp Thr Ala Lys Phe Asp Met Gln Lys Leu Glu
165 170 175

Asn Pro Asp Thr Gln Gly Val Gly Tyr Gln Gln Gly Arg Met Phe Gly

180 185 190

Tyr Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu Asn Tyr Thr Cys
195 200 205

Ile Tyr Cys Gly Ile His Ala Ser Lys Ala Lys Met Glu Ile Glu His

210 215 220

Val Ile Pro Arg Ser Arg Gly Gly Thr Asp Ser Leu Asn Asn Leu Val

225 230 235 240

Leu Ser Cys Arg Ala Cys Asn Glu Ala Lys Gly Ser Gln Asp Val Gln

245 250 255

Thr Tyr Leu Lys Gly Asn Pro Ser Val Leu Arg Arg Val Lys Ala Arg

260 265 270

Leu Asn Thr Asn Tyr Arg Asp Ala Ala His Thr Asn Ser Ile Arg Leu

275 280 285

Phe Val Leu Asn Lys Leu Gln Thr Met Ala Asp Ala Ile Gly Thr Asn

290 295 300

Leu Asn Val Gly Phe Gly Tyr Thr Thr Lys Gln Asn Arg Leu Leu Leu

305 310 315 320

Asn Leu Pro Lys Asp His Trp Ile Asp Ala Ala Val Cys Thr Ser Asp

325 330 335

Gly Ser Ala Val Lys Val Asp Pro Ser Leu Lys Pro Leu Thr Ile Lys

340 345 350

Ala Ile Gly Arg Gly Ser Arg Gln Phe Cys Arg Met Asn Lys Tyr Gly

355 360 365

Phe Pro Arg Thr Ser Pro Lys Pro Arg Ser Lys Asn Phe Phe Gly Phe

370 375 380

Lys Thr Gly Asp Met Val Lys Val Val Val Pro Leu Gly Ser Lys Thr

385 390 395 400

Lys Val Pro Val Gly Thr His Thr Gly Arg Val Ala Val Arg Ser Ser

405 410 415

Gly Ser Phe Asp Val Lys Thr Arg Asp Ala Lys Leu Gly Ile Tyr His

420 425 430

Lys Tyr Cys Gln Gln Ile His Leu Met Asp Gly Tyr Ser Tyr Ala

435 440 445

<210> 174

<211> 447

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-151 effector

<400> 174

Val Gly Phe Lys Gln Pro Asn Phe Asn Lys Val Leu Val Leu Asp Thr
1 5 10 15

Asn Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala Arg Ala Lys Lys Leu
20 25 30

Leu Asn Ser Gly Arg Ala Ser Val Phe Arg Arg Phe Pro Phe Thr Ile
35 40 45

Ile Leu His Asp Arg Thr Val Glu Glu Ser Glu Leu Gln Asp Thr Glu
50 55 60

Ile Lys Ile Asp Gln Gly Ser Lys Thr Thr Gly Val Ala Leu Leu Val
65 70 75 80

His Gly Gln Asp Gly Thr Thr Val Ala Leu Ala Ala His Val Glu His
85 90 95

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

Ser Arg Arg His Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn
115 120 125

Arg Thr Arg Pro Lys Gly Trp Leu Pro Pro Ser Leu Val Ser Lys Ala
130 135 140

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

Thr Lys Phe Ala Leu Glu Thr Ala Lys Phe Asp Met Gln Lys Leu Ala
165 170 175

Asn Pro Asn Ile Glu Gly Val Gly Tyr Gln Gln Gly Arg Met Phe Gly
180 185 190

Tyr Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu Gln Gly Cys Cys

195 200 205

Ile Tyr Cys Gly Ile His Ala Ser Lys Ala Lys Met Glu Ile Glu His

210 215 220

Val Ile Pro Arg Ser Arg Gly Gly Thr Asp Ser Leu Asn Asn Leu Val

225 230 235 240

Leu Ser Cys Tyr Ala Cys Asn Gln Ala Lys Gly Asn Leu Ser Leu Ser

245 250 255

Glu Tyr Leu Lys Gly Lys Pro Ser Val Leu Lys Arg Val Lys Glu His

260 265 270

Leu Gly Ile Asn Tyr Arg Asp Ala Ala His Thr Asn Ser Ile Arg Leu

275 280 285

Tyr Val Met Asn Lys Leu Arg Ala Met Ala Glu Ala Ile Gly Ala Lys

290 295 300

Leu Val Val Gly Phe Gly Ser Thr Thr Lys Gln Asn Arg Leu Leu Leu

305 310 315 320

Gly Leu Pro Lys Asp His Trp Ile Asp Ala Ala Val Cys Thr Lys Asp

325 330 335

Gly Ala Ser Val Arg Val Glu Pro Ala Leu Lys Pro Leu Val Ile Lys

340 345 350

Ala Val Gly Arg Gly Ser Arg Gln Phe Cys Arg Met Asp Lys His Gly

355 360 365

Phe Pro Arg Thr Ser Pro Lys Pro Arg Ser Lys Asn Phe Phe Gly Phe

370 375 380

Lys Thr Gly Asp Met Val Lys Val Ile Val Pro Thr Gly Ala Lys Thr

385 390 395 400

Lys Val Pro Thr Gly Thr Tyr Thr Gly Arg Val Ala Val Arg Ser Lys

405 410 415

Gly Ser Phe Asp Val Lys Thr Arg Asp Thr Lys Leu Thr Val Ser His

420 425 430

Lys Tyr Cys Lys Gln Ile His Leu Met Asp Gly Tyr Ser Tyr Ala

435 440 445

<210> 175

<211> 447

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-152 effector

<400> 175

Val Gly Phe Lys Gln Pro Asn Phe Asn Lys Val Leu Val Leu Asp Thr

1 5 10 15

Asn Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala Arg Ala Lys Lys Leu

20 25 30

Leu Asn Ser Gly Arg Ala Ser Val Phe Arg Arg Phe Pro Phe Thr Ile

35 40 45

Ile Leu His Asp Arg Thr Val Glu Glu Ser Glu Leu Gln Asp Thr Glu

50 55 60

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

65 70 75 80

His Gly Gln Asp Gly Thr Thr Val Ala Leu Ala Ala His Val Glu His

85 90 95

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

100 105 110

Ser Arg Arg His Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn

115 120 125

Arg Thr Arg Pro Lys Gly Trp Leu Pro Pro Ser Leu Val Ser Lys Ala

130 135 140

Glu Asn Ile Leu Asn Trp Val Ile Arg Phe Thr Lys Leu Ala Pro Phe

145 150 155 160

Thr Lys Phe Ala Leu Glu Thr Ala Lys Phe Asp Met Gln Lys Leu Glu

165 170 175

Asn Pro Asp Thr Gln Gly Val Gly Tyr Gln Gln Gly Arg Met Phe Gly

180 185 190

Tyr Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu Asn Tyr Thr Cys

195 200 205

Ile Tyr Cys Gly Ile His Ala Ser Lys Ala Lys Met Glu Ile Glu His

210 215 220

Val Ile Pro Arg Ser Arg Gly Gly Thr Asp Ser Leu Asn Asn Leu Val

225 230 235 240

Leu Ser Cys Arg Ala Cys Asn Glu Ala Lys Gly Ser Gln Asp Val Gln

245 250 255

Thr Tyr Leu Lys Gly Asn Pro Ser Val Leu Arg Arg Val Lys Ala Arg

260 265 270

Leu Asn Thr Asn Tyr Arg Asp Ala Ala His Thr Asn Ser Ile Arg Leu

275 280 285

Phe Val Leu Asn Lys Leu Gln Thr Met Ala Asp Ala Ile Gly Thr Asn

290 295 300

Leu Asn Val Gly Phe Gly Tyr Thr Thr Lys Gln Asn Arg Leu Leu Leu

305 310 315 320

Asn Leu Pro Lys Asp His Trp Ile Asp Ala Ala Val Cys Thr Ser Asp

325 330 335

Gly Ser Ala Val Lys Val Asp Pro Ser Leu Lys Pro Leu Thr Ile Lys

340 345 350

Ala Ile Gly Arg Gly Ser Arg Gln Phe Cys Arg Met Asn Lys Tyr Gly

355 360 365

Phe Pro Arg Thr Ser Pro Lys Pro Arg Ser Lys Asn Phe Phe Gly Phe

370 375 380

Lys Thr Gly Asp Met Val Lys Val Val Val Pro Leu Gly Ser Lys Thr

385 390 395 400

Lys Val Pro Val Gly Thr His Thr Gly Arg Val Ala Val Arg Ser Ser

405 410 415

Gly Ser Phe Asp Val Lys Thr Arg Asp Ala Lys Leu Gly Ile Tyr His

420 425 430

Lys Tyr Cys Gln Gln Ile His Leu Met Asp Gly Tyr Ser Tyr Ala
435 440 445

<210> 176

<211> 447

<212> PRT

<213> Unknown

<220

><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-153 effector

<400> 176

Val Gly Phe Lys Gln Pro Asn Phe Asn Lys Val Leu Val Leu Asp Thr
1 5 10 15

Asn Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala Arg Ala Lys Lys Leu
20 25 30

Leu Asn Ser Gly Arg Ala Ser Val Phe Arg Arg Phe Pro Phe Thr Ile
35 40 45

Ile Leu His Asp Arg Thr Val Glu Glu Ser Glu Leu Gln Asp Thr Glu
50 55 60

Ile Lys Ile Asp Gln Gly Ser Lys Thr Thr Gly Val Ala Leu Leu Val
65 70 75 80

His Gly Gln Asp Gly Thr Thr Val Ala Leu Ala Ala His Val Glu His
85 90 95

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

Ser Arg Arg His Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn
115 120 125

Arg Thr Arg Pro Lys Gly Trp Leu Pro Pro Ser Leu Val Ser Lys Ala
130 135 140

Glu Asn Ile Leu Asn Trp Val Ile Arg Phe Thr Lys Leu Thr Pro Phe
145 150 155 160

Thr Lys Phe Ala Leu Glu Thr Ala Lys Phe Asp Met Gln Lys Leu Glu

165 170 175

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

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

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

Phe Pro Arg Thr Ser Pro Lys Pro Arg Ser Lys Asn Phe Phe Gly Phe
370 375 380
Lys Thr Gly Asp Met Val Lys Val Val Val Pro Leu Gly Ser Lys Thr
385 390 395 400
Lys Val Pro Val Gly Thr His Thr Gly Arg Val Ala Val Arg Ser Ser
405 410 415

Gly Ser Phe Asp Val Lys Thr Arg Asp Ala Lys Leu Gly Ile Tyr His
420 425 430

Lys Tyr Cys Gln Gln Ile His Leu Met Asp Gly Tyr Ser Tyr Ala
435 440 445

<210> 177

<211> 447

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-154 effector

<400> 177

Val Gly Phe Lys Gln Pro Asn Phe Asn Lys Val Leu Val Leu Asp Thr
1 5 10 15
Asn Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala Arg Ala Lys Lys Leu

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

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

Glu Asn Ile Leu Asn Trp Val Ile Arg Phe Thr Lys Leu Thr Pro Phe

145 150 155 160

Thr Lys Phe Ala Leu Glu Thr Ala Lys Phe Asp Met Gln Lys Leu Glu

165 170 175

Asn Pro Glu Thr Gln Gly Val Gly Tyr Gln Gln Gly Arg Met Phe Gly

180 185 190

Tyr Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu Asn Tyr Thr Cys

195 200 205

Ile Tyr Cys Gly Ile His Ala Ser Lys Ala Lys Met Glu Ile Glu His

210 215 220

Val Ile Pro Arg Ser Arg Gly Gly Thr Asp Ser Leu Asn Asn Leu Val

225 230 235 240

Leu Ser Cys Arg Ala Cys Asn Glu Ala Lys Gly Ser Gln Asn Val Gln

245 250 255

Thr Tyr Leu Lys Gly Asn Pro Ser Val Leu Arg Arg Val Lys Ala Arg

260 265 270

Leu Asn Thr Asn Tyr Arg Asp Ala Ala His Thr Asn Ser Ile Arg Leu

275 280 285

Phe Val Leu Asn Lys Leu Gln Thr Met Ala Asp Ala Ile Gly Thr Asn

290 295 300

Leu Asn Val Gly Phe Gly Tyr Thr Thr Lys Gln Asn Arg Leu Leu Leu

305 310 315 320

Asn Leu Pro Lys Asp His Trp Ile Asp Ala Ala Val Cys Thr Ser Asp

325 330 335

Gly Ser Ala Val Lys Val Asp Pro Ser Leu Lys Pro Leu Thr Ile Lys

340 345 350

Ala Ile Gly Arg Gly Ser Arg Gln Phe Cys Arg Met Asn Lys Tyr Gly

355 360 365

Phe Pro Arg Thr Ser Pro Lys Pro Arg Ser Lys Asn Phe Phe Gly Phe

370 375 380

Lys Thr Gly Asp Met Val Lys Val Val Val Pro Leu Gly Ser Lys Thr

385 390 395 400

Lys Val Pro Val Gly Thr His Thr Gly Arg Val Ala Val Arg Ser Ser

405 410 415

Gly Ser Phe Asp Val Lys Thr Arg Asp Ala Lys Leu Gly Ile Tyr His

420 425 430

Lys Tyr Cys Gln Gln Ile His Leu Met Asp Gly Tyr Ser Tyr Ala

435 440 445

<210> 178

<211> 447

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-155 effector

<400> 178

Val Gly Phe Lys Gln Pro Asn Phe Asn Lys Val Leu Val Leu Asp Thr

1 5 10 15

Asn Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala Arg Ala Lys Lys Leu

20 25 30

Leu Asn Ser Gly Arg Ala Ser Val Phe Arg Arg Phe Pro Phe Thr Val

35 40 45

Ile Leu His Asp Arg Thr Val Glu Glu Ser Glu Leu Gln Asp Thr Glu

50 55 60

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

65 70 75 80

His Gly Gln Asp Gly Thr Thr Val Ala Leu Ala Ala His Val Glu His

85 90 95

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

100 105 110

Ser Arg Arg His Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn

115 120 125

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

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

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

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

Phe Pro Arg Thr Ser Pro Lys Pro Arg Ser Lys Asn Phe Phe Gly Phe
370 375 380

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

<210> 179
<211> 314
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-156 effector
<400> 179
Val Gly Phe Lys Gln Pro Gln Phe Asn Lys Val Leu Val Leu Asp Thr
1 5 10 15
Asn Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala Arg Ala Arg Lys Leu
20 25 30
Leu Ser Gly Gly Arg Ala Ser Val Phe Arg Arg Phe Pro Phe Thr Ile

35 40 45
Ile Leu His Asp Arg Thr Val Glu Glu Ser Glu Leu Gln Asp Thr Glu
50 55 60
Ile Lys Ile Asp Gln Gly Ser Lys Thr Thr Gly Val Ala Leu Leu Val
65 70 75 80
His Gly Gln Asp Gly Asp Thr Val Ala Phe Ala Ala His Val Glu His
85 90 95

Arg Thr Asn Val Lys Ser Gly Leu Asp Ser Arg Arg Ile Ile Arg Arg

100 105 110

Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn

115 120 125

Arg Thr Lys Pro Lys Gly Trp Leu Pro Pro Ser Leu Met Ser Lys Ala

130 135 140

Glu Asn Ile Leu Asn Trp Val Thr Arg Phe Ala Lys Leu Thr Ser Ile

145 150 155 160

Thr Lys Phe Ala Ile Glu Thr Ala Lys Phe Asp Met Gln Lys Leu Glu

165 170 175

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

180 185 190

Tyr Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu Gln Arg Cys Cys

195 200 205

Ile Tyr Cys Gly Thr His Ala Ser Lys Ala Lys Met Glu Ile Glu His

210 215 220

Val Val Pro Arg Ser Arg Gly Gly Thr Asp Ser Leu Asn Asn Leu Val

225 230 235 240

Leu Ser Cys His Ala Cys Asn Gln Ala Lys Gly Asn Leu Ser Leu Ser

245 250 255

Glu Tyr Leu Lys Gly Lys Pro Ser Val Leu Lys Arg Val Lys Ser His

260 265 270

Leu Gly Ile Asn Tyr Arg Asp Ala Ala His Thr Asn Ser Ile Arg Leu

275 280 285

Tyr Val Met Asn Lys Leu Arg Val Met Ala Glu Ala Ile Gly Ala Lys

290 295 300

Leu Val Val Gly Phe Gly Ser Thr Thr Lys

305 310

<210> 180

<211> 425

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-157 effector

<400> 180

Val Gly Phe Lys Gln Pro Gln Phe Asn Lys Val Leu Val Leu Asp Thr
1 5 10 15

Asn Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala Arg Ala Arg Lys Leu
20 25 30

Leu Ser Gly Gly Arg Ala Ser Val Phe Arg Arg Phe Pro Phe Thr Ile
35 40 45

Ile Leu His Asp Arg Thr Val Glu Glu Ser Glu Leu Gln Asp Thr Glu
50 55 60

Ile Lys Ile Asp Gln Gly Ser Lys Thr Thr Gly Val Ala Leu Leu Val
65 70 75 80

His Gly Gln Asp Gly Asp Thr Val Ala Phe Ala Ala His Val Glu His
85 90 95

Arg Thr Asn Val Lys Ser Gly Leu Asp Ser Arg Arg Ile Ile Arg Arg
100 105 110

Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn
115 120 125

Arg Thr Lys Pro Lys Gly Trp Leu Pro Pro Ser Leu Met Ser Lys Ala
130 135 140

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

Thr Lys Phe Ala Ile Glu Thr Ala Lys Phe Asp Met Gln Lys Leu Glu
165 170 175

Ser Pro Asp Ile Gln Gly Val Gly Tyr Gln Gln Gly Arg Met Phe Gly
180 185 190

Tyr Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu Gln Arg Cys Cys
195 200 205

Ile Tyr Cys Gly Thr His Ala Ser Lys Ala Lys Met Glu Ile Glu His

210 215 220

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

275 280 285

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

340 345 350

Ala Val Gly Arg Gly Ser Arg Gln Phe Cys Arg Val Asp Lys Tyr Gly
355 360 365
Phe Pro Arg Thr Ser Pro Lys Pro Arg Ser Lys Asn Phe Phe Gly Phe
370 375 380
Lys Thr Gly Asp Met Val Lys Val Ile Val Pro Thr Gly Thr Lys Thr
385 390 395 400
Lys Val Leu Val Gly Thr Tyr Thr Gly Arg Val Ala Val Arg Ser Ser

405 410 415

Gly Tyr Phe Asp Val Lys Thr Lys Asp

420 425

<210> 181

<211> 447

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-158 effector

<400> 181

Val Gly Phe Lys Gln Pro Gln Phe Asn Lys Val Leu Val Leu Asp Thr
1 5 10 15

Asn Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala Arg Ala Arg Lys Leu
20 25 30

Leu Ser Gly Gly Arg Ala Ser Val Phe Arg Arg Phe Pro Phe Thr Ile
35 40 45

Ile Leu His Asp Arg Thr Val Glu Glu Ser Glu Leu Gln Asp Thr Glu
50 55 60

Ile Lys Ile Asp Gln Gly Ser Lys Thr Thr Gly Val Ala Leu Leu Val
65 70 75 80

His Gly Gln Asp Gly Asp Thr Val Ala Phe Ala Ala His Val Glu His
85 90 95

Arg Thr Asn Val Lys Ser Gly Leu Asp Ser Arg Arg Ile Ile Arg Arg
100 105 110

Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn
115 120 125

Arg Thr Lys Pro Lys Gly Trp Leu Pro Pro Ser Leu Met Ser Lys Ala
130 135 140

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

Thr Lys Phe Ala Ile Glu Thr Ala Lys Phe Asp Met Gln Lys Leu Glu
165 170 175

Ser Pro Asp Ile Gln Gly Val Gly Tyr Gln Gln Gly Arg Met Phe Gly
180 185 190

Tyr Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu Gln Arg Cys Cys
195 200 205

Ile Tyr Cys Gly Thr His Ala Ser Lys Ala Lys Met Glu Ile Glu His

210 215 220

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

275 280 285

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

340 345 350

Ala Val Gly Arg Gly Ser Arg Gln Phe Cys Arg Val Asp Lys Tyr Gly
355 360 365
Phe Pro Arg Thr Ser Pro Lys Pro Arg Ser Lys Asn Phe Phe Gly Phe
370 375 380
Lys Thr Gly Asp Met Val Lys Val Ile Val Pro Thr Gly Thr Lys Thr
385 390 395 400
Lys Val Leu Val Gly Thr Tyr Thr Gly Arg Val Ala Val Arg Ser Ser

405 410 415

Gly Tyr Phe Asp Val Lys Thr Lys Asp Ala Lys Leu Asn Val Ser His
420 425 430
Lys His Cys Gln Gln Ile Tyr Leu Met Asp Gly Tyr Ser Tyr Ala
435 440 445

<210> 182

<211> 447

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-159 effector

<400> 182

Val Gly Phe Lys Gln Pro Gln Phe Asn Lys Val Leu Val Leu Asp Thr
1 5 10 15

Asn Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala Arg Ala Arg Lys Leu
20 25 30

Leu Ser Gly Gly Arg Ala Ser Val Phe Arg Arg Phe Pro Phe Thr Ile
35 40 45

Ile Leu His Asp Arg Thr Val Glu Glu Ser Glu Leu Gln Asp Thr Glu
50 55 60

Ile Lys Ile Asp Gln Gly Ser Lys Thr Thr Gly Val Ala Leu Leu Val
65 70 75 80

His Gly Gln Asp Gly Asp Thr Val Ala Phe Ala Ala His Val Glu His
85 90 95

Arg Thr Asn Val Lys Ser Gly Leu Asp Ser Arg Arg Ile Ile Arg Arg
100 105 110

Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn
115 120 125

Arg Thr Lys Pro Lys Gly Trp Leu Pro Pro Ser Leu Met Ser Lys Ala
130 135 140

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

Thr Lys Phe Ala Ile Glu Thr Ala Lys Phe Asp Met Gln Lys Leu Glu
165 170 175

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

180 185 190

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

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

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

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

Lys Tyr Cys Lys Pro Ile His Leu Met Asp Gly Tyr Ser Tyr Ala
435 440 445

<210> 183
<211> 314
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-160 effector
<400> 183
Val Gly Phe Lys Gln Pro Gln Phe Asn Lys Val Leu Val Leu Asp Thr
1 5 10 15
Asn Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala Arg Ala Arg Lys Leu
20 25 30
Leu Ser Gly Gly Arg Ala Ser Val Phe Arg Arg Phe Pro Phe Thr Ile

35 40 45
Ile Leu His Asp Arg Thr Val Glu Glu Ser Glu Leu Gln Asp Thr Glu
50 55 60
Ile Lys Ile Asp Gln Gly Ser Lys Thr Thr Gly Val Ala Leu Leu Val
65 70 75 80
His Gly Gln Asp Gly Asp Thr Val Ala Phe Ala Ala His Val Glu His
85 90 95
Arg Thr Asn Val Lys Ser Gly Leu Asp Ser Arg Arg Ile Ile Arg Arg

100 105 110
Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn
115 120 125
Arg Thr Lys Pro Lys Gly Trp Leu Pro Pro Ser Leu Met Ser Lys Ala
130 135 140
Glu Asn Ile Leu Asn Trp Val Thr Arg Phe Ala Lys Leu Thr Ser Ile
145 150 155 160

Thr Lys Phe Ala Ile Glu Thr Ala Lys Phe Asp Met Gln Lys Leu Glu

165 170 175

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

180 185 190

Tyr Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu Gln Arg Cys Cys

195 200 205

Ile Tyr Cys Gly Thr His Ala Ser Lys Ala Lys Met Glu Ile Glu His

210 215 220

Val Val Pro Arg Ser Arg Gly Gly Thr Asn Ser Leu Asn Asn Leu Val

225 230 235 240

Leu Ser Cys His Ala Cys Asn Gln Ala Lys Gly Asn Leu Ser Leu Ser

245 250 255

Glu Tyr Leu Lys Gly Lys Pro Ser Val Leu Lys Arg Val Lys Ser His

260 265 270

Leu Gly Ile Asn Tyr Arg Asp Ala Ala His Thr Asn Ser Ile Arg Leu

275 280 285

Tyr Val Met Asn Lys Leu Arg Val Met Ala Glu Ala Ile Gly Ala Lys

290 295 300

Leu Val Val Gly Phe Gly Ser Thr Thr Lys

305 310

<210> 184

<211> 447

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-161 effector

<400> 184

Val Gly Phe Lys Gln Pro Gln Phe Asn Lys Val Leu Val Leu Asp Thr

1 5 10 15

Asn Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala Arg Ala Arg Lys Leu

20 25 30

Leu Ser Gly Gly Arg Ala Ser Val Phe Arg Arg Phe Pro Phe Thr Ile

35 40 45

Ile Leu His Asp Arg Thr Val Glu Glu Ser Glu Leu Gln Asp Thr Glu

50 55 60

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

65 70 75 80

His Gly Gln Asp Gly Asp Thr Val Ala Phe Ala Ala His Val Glu His

85 90 95

Arg Thr Asn Val Lys Ser Gly Leu Asp Ser Arg Arg Ile Ile Arg Arg

100 105 110

Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn

115 120 125

Arg Thr Lys Pro Lys Gly Trp Leu Pro Pro Ser Leu Met Ser Lys Ala

130 135 140

Glu Asn Ile Leu Asn Trp Val Thr Arg Phe Ala Lys Leu Thr Ser Ile

145 150 155 160

Thr Lys Phe Ala Ile Glu Thr Ala Lys Phe Asp Met Gln Lys Leu Glu

165 170 175

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

180 185 190

Tyr Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu Gln Arg Cys Cys

195 200 205

Ile Tyr Cys Gly Thr His Ala Ser Lys Ala Lys Met Glu Ile Glu His

210 215 220

Val Val Pro Arg Ser Arg Gly Gly Thr Asn Ser Leu Asn Asn Leu Val

225 230 235 240

Leu Ser Cys His Ala Cys Asn Gln Ala Lys Gly Asn Leu Ser Leu Ser

245 250 255

Glu Tyr Leu Lys Gly Lys Pro Ser Val Leu Lys Arg Val Lys Ser His

260 265 270

Leu Gly Ile Asn Tyr Arg Asp Ala Ala His Thr Asn Ser Ile Arg Leu

275 280 285

Tyr Val Met Asn Lys Leu Arg Val Met Ala Glu Ala Ile Gly Ala Lys

290 295 300

Leu Val Val Gly Phe Gly Ser Thr Thr Lys Lys Asn Arg Leu Ser Leu

305 310 315 320

Gly Leu Pro Lys Asp His Trp Ile Asp Ala Ala Val Cys Thr Lys Asp

325 330 335

Gly Ala Ser Ala Arg Val Val Pro Ser Leu Lys Pro Leu Val Ile Lys

340 345 350

Ala Val Gly Arg Gly Ser Arg Gln Phe Cys Arg Val Asp Lys Tyr Gly

355 360 365

Phe Pro Arg Thr Ser Pro Lys Pro Arg Ser Lys Asn Phe Phe Gly Phe

370 375 380

Lys Thr Gly Asp Met Val Lys Val Thr Ile Pro Asp Asn Ala Lys Thr

385 390 395 400

Lys Val Leu Thr Gly Thr Tyr Thr Gly Arg Val Ala Val Arg Ser Ser

405 410 415

Gly Tyr Phe Asp Val Lys Thr Lys Asp Thr Lys Leu Thr Val Ser His

420 425 430

Lys Tyr Cys Lys Pro Ile His Leu Met Asp Gly Tyr Ser Tyr Ala

435 440 445

<210> 185

<211> 351

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-162 effector

<400> 185

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

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

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

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

245 250 255

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

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

<210> 186
<211> 265
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-163 effector
<400> 186
Val Gly Tyr Gln Gln Gly Arg Met Phe Gly Tyr Ala Asp Lys Asn Ala

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

65 70 75 80

Pro Ser Val Leu Arg Arg Val Lys Ala Arg Leu Asn Thr Asn Tyr Arg

85 90 95

Asp Ala Ala His Thr Asn Ser Ile Arg Leu Phe Val Leu Asn Lys Leu

100 105 110

Gln Thr Met Ala Asp Ala Ile Gly Thr Asn Leu Asn Val Gly Phe Gly

115 120 125

Tyr Thr Thr Lys Gln Asn Arg Leu Leu Leu Asn Leu Pro Lys Asp His

130 135 140

Trp Ile Asp Ala Ala Val Cys Thr Ser Asp Gly Ser Ala Val Lys Val

145 150 155 160

Asp Pro Ser Leu Lys Pro Phe Thr Ile Lys Ala Ile Gly Arg Gly Ser

165 170 175

Arg Gln Phe Cys Arg Met Asn Lys Tyr Gly Phe Pro Arg Thr Ser Pro

180 185 190

Lys Pro Arg Ser Lys Asn Phe Phe Gly Phe Lys Thr Gly Asp Met Val

195 200 205

Lys Val Val Val Pro Leu Gly Ser Lys Thr Lys Val Pro Val Gly Thr

210 215 220

His Thr Gly Arg Val Ala Val Arg Ser Ser Gly Ser Phe Asp Val Lys

225 230 235 240

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

245 250 255

His Leu Met Asp Gly Tyr Ser Tyr Ala

260 265

<210> 187

<211> 56

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-164 effector

<400> 187

Val Ile Val Pro Thr Gly Ala Lys Thr Lys Val Ala Thr Gly Thr Tyr
1 5 10 15

Thr Gly Arg Val Ala Val Arg Ser Lys Gly Ser Phe Asp Val Lys Thr
20 25 30

Arg Asp Thr Lys Leu Thr Val Ser His Lys Tyr Cys Lys Gln Ile His
35 40 45

Leu Met Asp Gly Tyr Ser Tyr Ala
50 55

<210> 188

<211> 233

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-165 effector

<400> 188

Val Leu Asp Ile Thr Ser His Ala Asn Leu Val Glu Val Thr Ile Thr
1 5 10 15

Arg Ala Ile Gly Glu Glu Ile Thr Met Ser Asn Ala Val Phe Val Leu
20 25 30

Asp His Ala Gln Arg Pro Leu Arg Pro Val His Pro Ala Val Ala Arg
35 40 45

Arg Met Leu Asn Ala Lys Gln Ala Ala Val Phe Arg Arg Tyr Pro Phe
50 55 60

Thr Ile Ile Cys His Ala Gly Val Ser Thr Gly Ala Pro Leu Pro Leu
65 70 75 80

Arg Leu Lys Ile Asp Pro Gly Ser Lys Thr Thr Gly Leu Ala Leu Leu
85 90 95

Asp Gly Phe Arg Leu Leu Trp Ala Ala Glu Leu Gln His Arg Gly Gln

100 105 110

Arg Leu Lys Ala Ala Leu Asp Ala Arg Arg Ala Val Arg Arg Ser Arg

115 120 125

Arg Gln Arg Asn Thr Arg Tyr Arg Gln Pro Arg Phe Ala Asn Arg Thr

130 135 140

Arg Pro Ala Gly Trp Leu Pro Pro Ser Leu Trp Ser Arg Val Cys Asn

145 150 155 160

Val Met Thr Trp Val Glu Arg Leu Thr Arg Tyr Cys His Ile Thr Ala

165 170 175

Leu Ser Gln Glu Leu Val Arg Phe Asp Met Gln Leu Met Gln Asp Ala

180 185 190

Val Val Ser Gly Ile Ala Tyr Gln Gln Gly Glu Leu Ala Gly Tyr Glu

195 200 205

Val Arg Glu Tyr Leu Leu Glu Lys Trp His Arg Thr Cys Ala Tyr Cys

210 215 220

Gly Ala Lys Asn Val Pro Ile Gln Val

225 230

<210> 189

<211> 418

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-166 effector

<400> 189

Val Leu Gly Thr Thr Ser His Ala Asn Leu Val Glu Val Thr Ile Thr

1 5 10 15

Arg Ala Ile Gly Glu Glu Ile Thr Met Ser Asn Ala Val Phe Val Leu

20 25 30

Asp His Ala Gln Arg Pro Leu Arg Pro Val His Pro Ala Val Ala Arg

35 40 45

Arg Met Leu His Ala Lys Gln Ala Ala Val Phe Arg His Tyr Pro Phe
50 55 60
Thr Ile Ile Cys His Ala Gly Met Ser Thr Gly Ala Pro Leu Pro Leu
65 70 75 80
Arg Leu Lys Ile Asp Pro Gly Ser Lys Thr Thr Gly Leu Ala Leu Leu

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

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

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

275 280 285
Asn Ala Thr Arg Trp Ala Leu Tyr Ala Gln Leu Cys Ala Thr Gly Leu

290 295 300

Pro Val Glu Cys Gly Thr Gly Gly Arg Thr Lys Tyr Asn Arg Thr Arg

305 310 315 320

Leu Gly Ile Pro Lys Ser His Trp Gly Asp Ala Ala Cys Val Gly Ala

325 330 335

Ser Thr Pro Glu Ala Leu Asp Val Pro Arg Gly Ala Ala Ala Gly His

340 345 350

Pro Arg Pro Arg Ala Arg Met Pro Pro Glu Val Ser His Arg Cys Pro

355 360 365

Arg Leu Ser His Thr Thr Ser Gly Ser Gln Glu Ala Ala Phe Trp Leu

370 375 380

Ser Asp Gly Arg Tyr Cys Ala Arg Tyr Gly Ala Ser Trp Gln Ile Cys

385 390 395 400

Trp His Ala Arg Gly Ala Cys His Arg Ala Arg Ser Trp Val Val Gln

405 410 415

Pro Gln

<210> 190

<211> 197

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-167 effector

<400> 190

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

1 5 10 15

Thr Leu Tyr Asp Val Tyr Ala Thr Asp Gly Cys Ser Thr Lys Gly Phe

20 25 30

Arg Ile Ala Lys Asn Val Pro Lys Glu His Tyr Thr Asp Ala Tyr Cys

35 40 45

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

Ala Thr Asn Arg His Lys Ala Ile Glu Gln Lys Ser Asp Ser Leu Glu
100 105 110
Glu Phe Arg Glu Ala His Gly Asn Ala Ala Val Ser Gln Leu Thr Val
115 120 125
Lys Pro His His Pro Gln Cys Lys Asp Met Ala Arg Ile Met Pro Gly
130 135 140
Ala Val Met Val Phe Asp Gly Ala Val Gly Val Phe Gln Gly Ser Ser
145 150 155 160

Gly Gln Asn Asn Gly Thr Pro Asn Tyr Tyr Asn Ser Thr Lys Gly Glu
165 170 175
Arg Phe Leu Met Arg Ser Cys Val Leu Leu Ala Gln Asn Ala Gly Met
180 185 190
Val Phe Ile Pro Ala
195

<210> 191
<211> 271
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-168 effector
<
400> 191
Val Met Glu Leu Val Arg Phe Asp Leu Gln Gln Leu Glu Lys Pro Glu
1 5 10 15
Ile Ser Glu Ile Glu Tyr Gln Gln Gly Glu Leu Leu Gly Tyr Glu Ile

```
            20                  25                  30
Arg Glu Tyr Leu Leu Asn Lys Trp Asp Arg Lys Cys Thr Tyr Cys Lys
        35                  40                  45
Val Glu Asn Ile Pro Leu Gln Val Glu His Ile His Pro Arg Ala Lys
    50                  55                  60

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

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

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

Tyr Cys Gln Thr Leu Gln Arg Lys Asp Gly Tyr Ser Tyr Gln Phe
            260                 265                 270
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<210> 192

<211> 339

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-169 effector

<400> 192

Val Gln Pro Val Glu Phe Lys Val Asp Pro Gly Ser Lys Val Thr Gly
1 5 10 15
Leu Ala Leu Val Ala Glu Phe Glu Lys Arg Gly Arg Thr Val Val Trp

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

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

145 150 155 160
His Leu Asp His Val Leu Pro Arg Ser Arg Gly Gly Ser Asn Arg Val
165 170 175
Ser Asn Leu Val Pro Ala Cys Lys Pro Cys Asn Asp Ala Lys Ser Asn

180 185 190

Arg Ala Val Glu Asp Tyr Leu Val Asp Arg Pro Glu Val Leu Arg Gln

195 200 205

Val Lys Ala Gln Leu Arg Ser Pro Leu Lys Asp Ala Ala Val Met Asn

210 215 220

Ala Thr Arg Phe Ala Ile Val Asp Ala Leu Arg Glu Phe Gly Leu Glu

225 230 235 240

Val Arg Met Trp Ser Gly Gly Arg Thr Lys Trp Asn Arg Thr Asn Leu

245 250 255

Gly Leu Pro Lys Asp His Trp Ile Asp Ala Ala Cys Val Gly Glu Ser

260 265 270

Gly Ala Ala Val Arg Val Pro Val Leu Arg Pro Leu Thr Ile Thr Ala

275 280 285

Met Gly Arg Gly His Arg Arg Val His Gly Asn Asp Arg Tyr Gly Phe

290 295 300

Pro Arg Gly Thr Ala Arg Arg Ala Lys Arg Val Ala Gly Phe Gln Thr

305 310 315 320

Gly Asp Leu Val Arg Leu Val Cys Leu Arg Gly Lys Cys Ala Gly Val

325 330 335

His Thr Gly

<210> 193

<211> 428

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-170 effector

<400> 193

Val Arg Lys Tyr Met Val Lys Gln Pro Asn Phe Asn Lys Val Leu Val

1 5 10 15

Leu Asp Thr Asn Arg Lys Pro Leu Met Pro Cys Tyr Pro Ala Arg Ala
20 25 30
Lys Lys Leu Leu Asn Ser Gly Arg Ala Ser Val Phe Arg Arg Phe Pro

35 40 45
Phe Thr Ile Ile Leu His Asp Arg Thr Leu Glu Glu Ser Lys Leu Gln
50 55 60
Asp Met Glu Ile Lys Ile Asp Gln Gly Ser Lys Thr Thr Gly Val Ala
65 70 75 80
Leu Ile Val His Gly Lys Lys Ser Ser Thr Val Thr Leu Ala Ala His
85 90 95
Ile Glu His Arg Thr Asn Val Lys Ser Gly Leu Asp Ser Arg Arg Ala

100 105 110
Ile Arg Arg Ser Arg Arg His Arg Lys Thr Arg Tyr Arg Gln Ala Arg
115 120 125
Phe Leu Asn Arg Thr Lys Pro Lys Gly Trp Leu Pro Pro Ser Leu Val
130 135 140
Ser Lys Ala Glu Asn Ile Leu Asn Trp Val Ile Arg Phe Ala Lys Leu
145 150 155 160
Thr Pro Leu Thr Lys Phe Ala Leu Glu Thr Ala Lys Phe Asp Met Gln

165 170 175
Lys Leu Val Asn Pro Asn Ile Gln Gly Val Val Tyr Gln Gln Gly Arg
180 185 190
Met Phe Gly Tyr Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu Gln
195 200 205
Arg Cys Ser Ile Asp Cys Gly Ile His Ala Ser Lys Ala Lys Met Glu
210 215 220
Ile Glu His Val Ile Pro Arg Ser Arg Gly Gly Thr Asp Ser Leu Asn

225 230 235 240
Asn Leu Val Leu Ser Cys His Ala Cys Asn Gln Ala Lys Gly Asn Leu
245 250 255
Ser Leu Ser Glu Tyr Leu Lys Gly Lys Pro Ser Val Leu Lys Arg Val

260 265 270

Lys Ala His Leu Gly Ile Asn Tyr Arg Asp Ala Ala His Thr Asn Ser

275 280 285

Ile Arg Leu Tyr Val Met Asn Lys Leu Arg Ala Met Ala Glu Ala Ile

290 295 300

Gly Ala Lys Leu Val Val Gly Phe Gly Ser Thr Thr Lys Gln Asn Arg

305 310 315 320

Leu Leu Leu Gly Leu Pro Lys Asp His Trp Ile Asp Ala Ala Val Cys

325 330 335

Thr Lys Asp Gly Ala Ser Val Arg Val Glu Pro Ala Leu Lys Pro Leu

340 345 350

Val Ile Lys Ala Val Gly Arg Gly Ser Arg Gln Phe Cys Arg Met Asp

355 360 365

Lys His Gly Phe Pro Arg Thr Ser Pro Lys Pro Arg Ser Lys Asn Phe

370 375 380

Phe Gly Phe Lys Thr Gly Asp Met Val Lys Val Ile Val Pro Thr Gly

385 390 395 400

Ala Lys Thr Lys Val Pro Thr Gly Thr Tyr Thr Gly Arg Val Ala Val

405 410 415

Arg Ser Lys Gly Ser Phe Asp Val Lys Thr Arg Asp

420 425

<210> 194

<211> 307

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-171 effector

<400> 194

Val Ser Lys Ala Glu Asn Ile Leu Asn Trp Val Ile Arg Phe Ala Lys

1 5 10 15

Leu Thr Pro Leu Thr Lys Phe Ala Leu Glu Thr Ala Lys Phe Asp Met
20 25 30

Gln Lys Leu Glu Asn Pro Asp Thr Gln Gly Val Gly Tyr Gln Gln Gly
35 40 45
Arg Met Phe Gly Tyr Ala Asp Lys Lys Ala Tyr Leu Leu Glu Arg Glu
50 55 60
Asn Tyr Thr Cys Ile Tyr Cys Gly Ile His Ala Ser Lys Ala Lys Met
65 70 75 80
Glu Ile Glu His Val Ile Pro Arg Ser Arg Gly Gly Thr Asp Ser Leu
85 90 95

Asn Asn Leu Val Leu Ser Cys Arg Ala Cys Asn Glu Ala Lys Gly Ser
100 105 110
Gln Asp Val Gln Thr Tyr Leu Lys Gly Asn Pro Ser Val Leu Arg Arg
115 120 125
Val Lys Ala Arg Leu Asn Thr Asn Tyr Arg Asp Ala Ala His Thr Asn
130 135 140
Ser Ile Arg Leu Phe Val Leu Asn Lys Leu Gln Thr Met Ala Asp Ala
145 150 155 160

Ile Gly Thr Asn Leu Asn Val Gly Phe Gly Tyr Thr Thr Lys Gln Asn
165 170 175
Arg Leu Leu Leu Asn Leu Pro Lys Asp His Trp Ile Asp Ala Ala Val
180 185 190
Cys Thr Ser Asp Gly Ser Ala Val Lys Val Asp Pro Ser Leu Lys Pro
195 200 205
Leu Thr Ile Lys Ala Ile Gly Arg Gly Ser Arg Gln Phe Cys Arg Met
210 215 220

Asn Lys Tyr Gly Phe Pro Arg Thr Ser Pro Lys Pro Arg Ser Lys Asn
225 230 235 240
Phe Phe Gly Phe Lys Thr Gly Asp Met Val Lys Val Val Val Pro Leu
245 250 255
Gly Ser Lys Thr Lys Val Pro Val Gly Thr His Thr Gly Arg Val Ala

260 265 270

Val Arg Ser Ser Gly Ser Phe Asp Val Lys Thr Arg Asp Ala Lys Leu

275 280 285

Gly Ile Tyr His Lys Tyr Cys Gln Gln Ile His Leu Met Asp Gly Tyr

290 295 300

Ser Tyr Ala

305

<210> 195

<211> 37

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-172 effector

<400> 195

Val Val Arg Ala Arg Gly Ser Phe Asp Ile Gly Ile Gly Lys Lys Lys

1 5 10 15

Val Ser Gly Ile Ser Tyr Lys Tyr Cys Gln Leu Ile Gln Arg Val Asp

20 25 30

Gly Tyr Glu Tyr Thr

35

<210> 196

<211> 306

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-173 effector

<400> 196

Val Val Val Glu Leu Asn Arg Phe Ala Phe Met Ala Met Asp Asn Pro

1 5 10 15

Asn Ile Arg Arg Trp Glu Tyr Gln Gln Gly Pro Leu Tyr Gly Leu Gly

20 25 30

Ser Val Glu Asp Ala Val Tyr Ala Gln Gln Asp Gly His Cys Leu Phe

35 40 45

Cys Lys Lys Pro Ile Asp His Tyr His His Val Val Pro Arg His Lys

50 55 60

Gly Gly Ser Glu Thr Leu Ala Asn Arg Cys Gly Leu Cys Glu Arg His

65 70 75 80

His Ala Leu Val His Lys Asp Lys Ala Trp Ala Glu Lys Leu Val Thr

85 90 95

Arg Lys Gly Gly Met Asn Lys Lys Tyr His Ala Leu Ser Val Leu Asn

100 105 110

Gln Ile Ile Pro Phe Leu Met Glu Tyr Leu Gly Glu Glu Thr Pro Tyr

115 120 125

Asp Val Tyr Ala Thr Asp Gly Arg Ser Thr Lys Gly Phe Arg Val Ala

130 135 140

Lys Asn Val Pro Lys Glu His Tyr Thr Asp Ala Tyr Cys Val Ala Cys

145 150 155 160

Ser Ile Leu Gly Thr Asp Ile Asp Val Ser Ala Pro Val Glu Pro Phe

165 170 175

Glu Leu Lys Gln Phe Arg Arg His Asp Arg Gln Ala Cys Ile Arg Gln

180 185 190

Met Val Asp Arg Lys Tyr Leu Leu Asp Gly Lys Val Val Ala Ala Asn

195 200 205

Arg His Lys Ala Ile Glu Gln Lys Ser Asp Ser Leu Glu Glu Phe Arg

210 215 220

Glu Ala Tyr Gly Glu Ala Ala Val Ser Gln Leu Thr Val Arg Pro His

225 230 235 240

Leu Pro Gln Tyr Lys Asp Met Thr Arg Ile Met Pro Gly Ala Val Met

245 250 255

Asp Phe Asp Gly Thr Ile Gly Val Phe Gln Gly Ser Glu Gly Phe His

260 265 270

Asn Gly Lys Ser Asn Tyr Tyr Lys Ser Thr Lys Gly Thr Lys Val Leu

275 280 285

Thr Arg Arg Cys Ala Leu Leu Ala Lys Asn Val Gly Met Val Phe Ile

290 295 300

Pro Ala

305

<210> 197

<211> 269

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-174 effector

<400> 197

Val Tyr Ala Gln Gln Asp Gly His Cys Leu Phe Cys Lys Lys Pro Ile

1 5 10 15

Asp His Tyr His His Val Ile Pro Arg His Lys Arg Gly Ser Glu Thr

20 25 30

Leu Ala Asn Arg Cys Gly Leu Cys Ala Lys His His Ala Leu Val His

35 40 45

Lys Asp Lys Ala Trp Glu Glu Lys Met Val Thr Arg Lys Gly Gly Met

50 55 60

Asn Lys Lys Tyr His Ala Leu Ser Val Leu Asn Gln Ile Ile Pro His

65 70 75 80

Leu Met Glu His Leu Gly Ser Glu Thr Pro Tyr Asp Val Tyr Ala Thr

85 90 95

Asp Gly Lys Ser Thr Lys Gly Phe Arg Ile Ala Lys Asn Val Pro Lys

100 105 110

Glu His Tyr Thr Asp Ala Tyr Cys Ile Ala Cys Ser Ile Leu Asp Thr

115 120 125

Asp Ile Glu Val Ser Ala Pro Val Glu Pro Phe Glu Leu Lys Gln Phe
130 135 140

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

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

<210> 198

<211> 470
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-175 effector
<400> 198
Tyr Cys Tyr Val Arg Leu Leu Leu Lys Glu Lys Lys Ala Arg Val Val
1 5 10 15
Cys Thr Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr Pro Asp Val
20 25 30

Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr Asn Ile Gly

35 40 45

Val Ala Val Val Lys Glu Asp Gly Ser Cys Val Phe Ser Ala His Leu

50 55 60

Glu Thr Arg Asn Lys Glu Val Pro Leu Leu Met Lys Lys Arg Ala Ala

65 70 75 80

Phe Arg Arg Gln His Arg Thr Gln Asp Arg Arg Arg Lys Arg Gln Arg

85 90 95

Arg Ala Ile Ala Ala Gly Thr Thr Val Glu Ser Asn Thr Ile Glu Arg

100 105 110

Leu Leu Pro Gly Tyr Glu Lys Pro Val Val Cys His Tyr Ile Arg Asn

115 120 125

Lys Glu Ala Arg Phe Asn Asn Arg Ser Arg Pro Ala Gly Trp Leu Thr

130 135 140

Pro Thr Ala Asn His Leu Leu Gln Thr His Ile Asn Leu Ile Ala Lys

145 150 155 160

Val Ala Lys Phe Leu Pro Ile Thr Lys Val Val Ile Glu Leu Asn Arg

165 170 175

Phe Ala Phe Met Ala Met Asp Asn Pro Asn Ile Arg Arg Trp Glu Tyr

180 185 190

Gln Gln Gly Pro Leu Tyr Gly Leu Gly Ser Val Glu Asp Ala Val Tyr

195 200 205

Ala Gln Gln Asp Gly His Cys Leu Phe Cys Glu Lys Pro Met Asp His

210 215 220

Tyr His His Val Val Pro Arg His Lys Gly Gly Ser Glu Thr Leu Ala

225 230 235 240

Asn Arg Cys Gly Leu Cys Ala Arg His His Asp Leu Val His Thr Asp

245 250 255

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

260 265 270

Lys Tyr His Ala Leu Ser Val Leu Asn Gln Ile Ile Pro His Leu Ile

275 280 285

Glu His Leu Gly Ser Glu Thr Pro Tyr Glu Ala Tyr Ala Thr Asp Gly

290 295 300

Lys Ser Thr Lys Gly Phe Arg Ile Ala Lys Asn Val Pro Lys Glu His

305 310 315 320

Tyr Thr Asp Ala Tyr Cys Ile Ala Cys Ser Ile Leu Asp Thr Asp Ile

325 330 335

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

340 345 350

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

355 360 365

Leu Asp Gly Lys Val Val Ala Thr Asn Arg His Lys Ala Ile Glu Gln

370 375 380

Lys Ser Asp Ser Leu Gln Glu Phe Arg Glu Ala Tyr Gly Gly Ala Ala

385 390 395 400

Val Ser Gln Leu Thr Val Lys Pro His Pro Pro Gln Tyr Lys Asp Met

405 410 415

Thr Arg Ile Met Pro Gly Ala Val Met Asp Phe Asn Gly Thr Ile Gly

420 425 430

Val Met Gln Ser Ser Ile Val Gly Arg Phe Tyr Lys Ser Thr Lys Gly

435 440 445

Tyr Lys Ala Ala Pro Arg Arg Cys Val Leu Leu Ala Gln Asn Ala Gly

450 455 460

Met Val Phe Leu Pro Ala

465 470

<210> 199

<211> 113

<212> RNA

<213> Artificial Sequence

<220><223> Description of Artificial Sequence: Synthetic polynucleotide

<220><223> Category: MG33 active effectors tracrRNA sequence

<220><223> Description: MG33-1 tracrRNA sequence

<400> 199

cuuucagaau acucucuuuu uugguagcgg augaaacucc agggcacuuu gaugugcccg 60

ugauccuucg gaugcccgag ccucggggcc aaugggucag cuggcuacga ggg 113

<210> 200

<211> 127

<212> RNA

<213> Artificial Sequence

<220><223> Description of Artificial Sequence: Synthetic polynucleotide

<220><223> Category: MG34 active effectors tracrRNA sequence

<220><223> Description: MG34-1 tracrRNA sequence

<400> 200

gcgaaauuuu aaaagagccu uaauuguaaa acgccuauac agugaaggga uauacgcuug 60

gguuugucca gccugagccu cuaugccaga aauggcgccu ucaucguggg uuaggacauu 120

uaauuuu 127

<210> 201

<211> 128

<212> RNA

<213> Artificial Sequence

<220><223> Description of Artificial Sequence: Synthetic polynucleotide

<220><223> Category: putative sgRNA

<220><223> Description: putative MG33-1 sgRNA

<220><221> modified_base

<222> (1)..(22)

<223> a, c, u, g, unknown or other

<400> 201

nnnnnnnnnn nnnnnnnnnn nnguuucaca cgcuagaaau agcggaugaa acuccagggc 60

acuuugaugu gcccgugauc cuucggaugc ccgagccucg gggccaaugg gucagcuggc 120

uacgaggg 128

<210> 202

<211> 93

<212> RNA

<213> Artificial Sequence

<220><223> Description of Artificial Sequence: Synthetic
oligonucleotide

<220><223> Category: putative sgRNA

<220><223> Description: putative MG34-1 sgRNA

<

220><221> modified_base

<222> (1)..(22)

<223> a, c, u, g, unknown or other

<400> 202

nnnnnnnnnn nnnnnnnnnn nnguuacagu uaaggcucug aaaagagccu uaauuguaaa 60

acgccuauac agugaaggga uauacgcuug ggu 93

<210> 203

<211> 157

<212> RNA

<213> Artificial Sequence

<220><223> Description of Artificial Sequence: Synthetic
polynucleotide

<220><223> Category: putative sgRNA

<220><223> Description: putative MG34-1 sgRNA

<220><221> modified_base

<222> (1)..(22)

<223> a, c, u, g, unknown or other

<400> 203

nnnnnnnnnn nnnnnnnnnn nnguuacagu uaaggcucug aaaagagccu uaauuguaaa 60

acgccuauac agugaaggga uauacgcuug gguuugucca gccugagccu cuaugccaga 120

aauggcgccu ucaucguggg uuaggacauu uaauuuu 157

<210> 204

<211> 28

<212> RNA

<213> Artificial Sequence

<220><223> Description of Artificial Sequence: Synthetic

oligonucleotide

<220><223> Category: target

<220><223> Description: test target sequence

<400> 204

cgugagccac cacgucgcaa gccucgac 28

<210> 205

<211> 7

<212> PRT

<213> Simian virus 40

<220><223> Category: NLS

<220><223> Description: SV40 NLS

<400> 205

Pro Lys Lys Lys Arg Lys Val

1 5

<210> 206

<211> 16

<212> PRT

<213> Homo sapiens

<220><223> Category: NLS

<220><223> Description: nucleoplasmin bipartite NLS

<400> 206

Lys Arg Pro Ala Ala Thr Lys Lys Ala Gly Gln Ala Lys Lys Lys Lys

1 5 10 15

<210> 207

<211> 9

<212> PRT

<213> Homo sapiens

<220><223> Category: NLS

<220><223> Description: c-myc NLS

<400> 207

Pro Ala Ala Lys Arg Val Lys Leu Asp

1 5

<210> 208

<211> 11

<212> PRT

<213> Homo sapiens

<220><223> Category: NLS

<220><223> Description: c-myc NLS

<400> 208

Arg Gln Arg Arg Asn Glu Leu Lys Arg Ser Pro

1 5 10

<210> 209

<211> 38

<212> PRT

<213> Mus sp.

<220><223> Category: NLS

<220

><223> Description: hnRNPA1 M9 NLS

<400> 209

Asn Gln Ser Ser Asn Phe Gly Pro Met Lys Gly Gly Asn Phe Gly Gly

1 5 10 15

Arg Ser Ser Gly Pro Tyr Gly Gly Gly Gly Gln Tyr Phe Ala Lys Pro

20 25 30

Arg Asn Gln Gly Gly Tyr

35

<210> 210

<211> 42

<212> PRT

<213> Homo sapiens

<220><223> Category: NLS

<220><223> Description: Importin-alpha IBB domain NLS

<400> 210

Arg Met Arg Ile Glx Phe Lys Asn Lys Gly Lys Asp Thr Ala Glu Leu

1 5 10 15

Arg Arg Arg Arg Val Glu Val Ser Val Glu Leu Arg Lys Ala Lys Lys

20 25 30

Asp Glu Gln Ile Leu Lys Arg Arg Asn Val

35 40

<210> 211

<211> 8

<212> PRT

<213> Mus musculus polyomavirus 1

<220><223> Category: NLS

<220><223> Description: Myoma T protein NLS

<400> 211

Val Ser Arg Lys Arg Pro Arg Pro

1 5

<210> 212

<211> 8

<212> PRT

<213> Mus musculus polyomavirus 1

<220><223> Category: NLS

<220><223> Description: Myoma T protein NLS

<400> 212

Pro Pro Lys Lys Ala Arg Glu Asp

1 5

<210> 213

<211> 8

<212> PRT

<213> Homo sapiens

<220><223> Category: NLS

<220><223> Description: p53 NLS

<400> 213

Pro Gln Pro Lys Lys Lys Pro Leu

1 5

<210> 214

<211> 12

<212> PRT

<213> Mus sp.

<220><

223> Category: NLS

<220><223> Description: mouse c-abl IV NLS

<400> 214

Ser Ala Leu Ile Lys Lys Lys Lys Lys Met Ala Pro

1 5 10

<210> 215

<211> 5

<212> PRT

<213> Influenza virus

<220><223> Category: NLS

<220><223> Description: influenza virus NS1 NLS

<400> 215

Asp Arg Leu Arg Arg

1 5

<210> 216

<211> 7

<212> PRT

<213> Influenza virus

<220><223> Category: NLS

<220><223> Description: influenza virus NS1 NLS

<400> 216

Pro Lys Gln Lys Lys Arg Lys

1 5

<210> 217

<211> 10

<212> PRT

<213> Hepatitis delta virus

<220><223> Category: NLS

<220><223> Description: Hepatitis virus delta antigen NLS

<400> 217

Arg Lys Leu Lys Lys Lys Ile Lys Lys Leu

1 5 10

<210> 218

<211> 10

<212> PRT

<213> Mus sp.

<220><223> Category: NLS

<220><223> Description: mouse Mx1 protein NLS

<400> 218

Arg Glu Lys Lys Lys Phe Leu Lys Arg Arg

1 5 10

<210> 219

<211> 20

<212> PRT

<213> Homo sapiens

<220><223> Category: NLS

<220><223> Description: human poly(ADP-ribose) polymerase NLS

<400> 219

Lys Arg Lys Gly Asp Glu Val Asp Gly Val Asp Glu Val Ala Lys Lys

1 5 10 15

Lys Ser Lys Lys

20

<210> 220

<211> 17

<212> PRT

<213> Homo sapiens

<220><223> Category: NLS

<220><223> Description: steroid hormone receptors glucocorticoid NLS

<400> 220

Arg Lys Cys Leu Gln Ala Gly Met Asn Leu Glu Ala Arg Lys Thr Lys

1 5 10 15

Lys

<210> 221

<211> 428

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-4 effector

<400> 221

Val Ser Lys Val Phe Val Leu Asp Thr Asn Lys Gln Pro Leu Asn Pro
1 5 10 15
Ile His Ser Gly Arg Ala Arg Met Leu Leu Ser Gln Gly Lys Ala Ala
20 25 30

Val Phe Arg Gly Phe Pro Phe Thr Leu Ile Leu Lys Glu Glu Val Ser
35 40 45
Ser Pro Asp Val Lys Pro Leu Arg Ile Lys Ile Asp Pro Gly Ala Lys
50 55 60
Thr Thr Gly Leu Ala Leu Val Asn Asp Lys Thr Gly Glu Val Val Trp
65 70 75 80
Val Ala Glu Leu Gln His Arg Asp Phe Gln Ile Arg Asp Ala Leu Thr
85 90 95

Ser Arg Arg Gln Leu Arg Arg Phe Arg Arg Ser Arg Lys Thr Arg Tyr
100 105 110
Arg Lys Pro Arg Phe Leu Asn Arg Thr Arg Pro Lys Gly Trp Leu Pro
115 120 125
Pro Ser Leu Asn Ser Arg Val Ala Asn Ile Leu Thr Trp Val Lys Arg
130 135 140
Leu Ser Ser Leu Cys Gln Ile Asn Ala Ile Ser Gln Glu Leu Val Arg
145 150 155 160

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

210 215 220

Ser Asn Leu Cys Leu Ala Cys Val Pro Cys Asn Arg Glu Lys Gly Asn
225 230 235 240
Gln Asp Ile Lys Asp Phe Leu Lys Gly Lys Pro Asp Leu Leu Lys Arg
245 250 255
Ile Leu Gly Gln Ala Lys Arg Pro Leu Ala Asp Thr Ser Ala Val Asn
260 265 270
Ala Thr Arg Trp Asn Leu Tyr Asp Asn Leu Arg Gln Thr Ser Leu Pro
275 280 285

Val Glu Val Gly Thr Gly Gly Leu Thr Lys Tyr Asn Arg Thr Ile Arg
290 295 300
Gly Leu Asp Lys Thr His Tyr Trp Asp Ala Ala Cys Val Gly Ala Ser
305 310 315 320
Thr Pro Glu Arg Leu Ile Thr Ser Gly Ile Lys Pro Leu Leu Ile Ser
325 330 335
Ala Lys Gly His Gly Thr Arg Gln Gln Cys Arg Thr Asn Lys Leu Gly
340 345 350

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

His Ile His Lys Lys Asp Gly Tyr Ala Tyr Ala Tyr
420 425

<210> 222
<211> 428
<212> PRT
<213> Unknown

<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-419 effector
<400> 222

Met Ser Lys Val Phe Val Leu Asp Thr Asn Lys Gln Pro Leu Asn Pro
1 5 10 15
Ile His Ser Gly Arg Ala Arg Met Leu Leu Ser Gln Gly Lys Ala Ala

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

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

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

Glu Ile Glu His Ile Gln Pro Arg Ser Lys Gly Gly Ser Asn Arg Val

210 215 220

Ser Asn Leu Cys Leu Ala Cys Val Pro Cys Asn Arg Glu Lys Gly Asn
225 230 235 240

Gln Asp Ile Lys Asp Phe Leu Lys Gly Lys Pro Asp Leu Leu Lys Arg
245 250 255

Ile Leu Gly Gln Ala Lys Arg Pro Leu Ala Asp Thr Ser Ala Val Asn
260 265 270

Ala Thr Arg Trp Asn Leu Tyr Asp Asn Leu Arg Gln Thr Ser Leu Pro

275 280 285

Val Glu Val Gly Thr Gly Gly Leu Thr Lys Tyr Asn Arg Thr Ile Arg
290 295 300

Gly Leu Asp Lys Thr His Tyr Trp Asp Ala Ala Cys Val Gly Ala Ser
305 310 315 320

Thr Pro Glu Arg Leu Ile Thr Ser Gly Ile Lys Pro Leu Leu Ile Ser
325 330 335

Ala Lys Gly His Gly Thr Arg Gln Gln Cys Arg Thr Asn Lys Leu Gly

340 345 350

Phe Pro Val Arg Tyr Cys Ser Arg Thr Lys Phe His Lys Gly Phe Gln
355 360 365

Thr Gly Asp Ile Val Lys Ala Val Val Thr Ser Gly Lys Lys Val Gly
370 375 380

Thr Tyr Val Gly Arg Val Ala Thr Arg Ala Thr Leu Arg Phe Asn Ile
385 390 395 400

Ser Thr Lys Asp Gly Leu Val Gln Gly Ile Ser His Lys Tyr Cys Lys

405 410 415

His Ile His Lys Lys Asp Gly Tyr Ala Tyr Ala Tyr

420 425

<210> 223

<211> 493

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-420 effector

<400> 223

Met Ser Lys Thr Asn Tyr Val Leu Val Val Asp Thr Asn Lys His Pro
1 5 10 15

Leu Ser Pro Cys Lys Pro Gly Val Ala Arg Ser Leu Leu Lys Ala Gly
20 25 30

Lys Ala Ala Val Phe Arg Arg Tyr Thr Phe Thr Ile Ile Leu Lys Lys
35 40 45

Glu Val Glu Gly Asp Ile Leu Lys Ser Gln Ile Lys Ile Asp Pro Gly
50 55 60

Ser Lys Thr Thr Gly Leu Ala Leu Val Gln Asn Gly Val Val Ile Trp
65 70 75 80

Ala Ala Glu Leu Gln His Arg Gly Gln Leu Ile Lys Gln Ser Leu Asp
85 90 95

Asn Arg Arg Ser Leu Arg Arg Asn Arg Arg Asn Arg Lys Thr Arg Tyr
100 105 110

Arg Gln Pro Arg Phe Leu Asn Arg Val Lys Ser Lys Pro Lys Gly Trp
115 120 125

Leu Ala Pro Ser Leu Met His Arg Val Glu Asn Val Ser Thr Trp Val
130 135 140

Asn Lys Leu Ile Lys Phe Ser Ala Val Asp Ser Val Met Met Glu Leu
145 150 155 160

Val Arg Phe Asp Thr Gln Lys Met Thr Asn Pro Asp Val Ser Gly Val
165 170 175

Gln Tyr Gln Gln Gly Glu Leu Thr Gly Tyr Glu Val Arg Glu Tyr Leu
180 185 190

Leu Glu Lys Phe Asp Arg Thr Cys Val Tyr Cys Gln Ala Lys Asn Val

195 200 205

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

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

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

Lys Ser Leu Thr His Gly Lys Gln Ile Asp Val Asn His Lys Tyr Cys
405 410 415
Lys Ala Ile His Lys Leu Asp Gly Tyr Gly Tyr Gly Phe Gly Glu Leu
420 425 430
Ile Asn Ile Asn Pro Thr Lys Leu Asn Pro Val Glu Thr Gln Ile Val
435 440 445

Lys Gly Arg Thr Ala Ala Asn Pro Thr Gln Leu Asn Leu Phe Asp Ser
450 455 460

Ser Ile Phe Ala Val Glu Ser Ser Glu Ser Lys Ile His Lys Lys Gln
465 470 475 480
Lys Val Lys Gly Asp Asp Tyr Glu Gln Leu Ser Leu Phe
485 490

<210> 224
<211> 428
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-421 effector
<400> 224
Met Ser Lys Val Phe Val Leu Asp Thr Asn Lys Gln Pro Leu Asn Pro

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

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

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

130 135 140

Leu Ser Ser Leu Cys Gln Ile Asn Ala Ile Ser Gln Glu Leu Val Arg

145 150 155 160

Phe Asp Thr Gln Gln Met Glu Asn Pro Glu Ile Ser Gly Ile Ala Tyr

165 170 175

Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu Phe Leu Leu Phe

180 185 190

Lys Trp Asp Arg Thr Cys Ala Tyr Cys Gly Ala Lys Asp Thr Lys Leu

195 200 205

Glu Val Glu His Ile Gln Ser Arg Ser Lys Gly Gly Ser Asn Arg Val

210 215 220

Ser Asn Leu Cys Leu Ala Cys Val Pro Cys Asn Arg Glu Lys Gly Asn

225 230 235 240

Gln Asp Ile Lys Asp Phe Leu Lys Gly Lys Pro Asp Leu Arg Lys Gln

245 250 255

Ile Leu Ala Gln Ala Lys Arg Pro Leu Ala Asp Ala Ala Ala Val Asn

260 265 270

Val Thr Arg Trp Asn Leu Tyr Phe Asn Leu Lys Lys Met Gly Leu Pro

275 280 285

Val Glu Ile Gly Thr Gly Gly Arg Thr Lys Tyr Asn Arg Thr Lys Leu

290 295 300

Leu Leu Glu Lys Thr His Tyr Trp Asp Ala Ala Cys Val Gly Glu Ser

305 310 315 320

Thr Pro Glu Arg Leu Ile Thr Ala Gly Ile Lys Pro Leu Leu Ile Asn

325 330 335

Ala Lys Gly His Gly Thr Arg Gln Gln Cys Arg Pro Asn Lys Phe Gly

340 345 350

Phe Pro Val Arg Tyr Cys Ser Arg Thr Lys Phe His Lys Gly Phe Gln

355 360 365

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

370 375 380

Thr His Gln Gly Arg Val Ala Thr Arg Ala Thr Gly Arg Phe Asn Ile

385 390 395 400

Ser Thr Thr Asp Gly Leu Val Gln Gly Ile Ser His Lys Tyr Cys Lys

405 410 415

His Ile His Lys Lys Asp Gly Tyr Ala Tyr Val Ala

420 425

<210> 225

<211> 159

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-176 effector

<400> 225

Ala Ala Val Asn Ala Thr Arg Trp Ala Leu Phe Asn Arg Leu Lys Glu

1 5 10 15

Phe Gly Leu Asp Leu Asp Val Gly Thr Gly Gly Arg Thr Gln Phe Asn

20 25 30

Arg Thr Gln Gln Gly Leu Pro Lys Thr His Trp Ile Asp Ala Ala Cys

35 40 45

Val Gly Glu Ser Thr Pro Lys Leu Val Leu Cys Thr Asn Gln Pro Leu

50 55 60

Leu Ile Ala Ala Lys Gly His Gly Thr Arg Gln Met Cys Gly Thr Asp

65 70 75 80

Lys Tyr Gly Phe Pro Thr Arg His Arg Ser Arg Val Gln Ile His Lys

85 90 95

Gly Phe Gln Thr Gly Asp Ile Val Lys Ala Thr Val Thr Ala Gly Arg

100 105 110

Lys Thr Gly Ser Tyr Ala Gly Arg Val Leu Cys Arg Ala Ser Gly Ser

115 120 125

Phe Asp Val Ala Thr Pro Ser Ala Arg Val Ala Gly Ile Ser His Lys
130 135 140
Tyr Cys Lys Ala Ile His Lys Lys Asp Gly Tyr Ala Tyr Ala Phe
145 150 155

<210> 226
<211> 197
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-177 effector
<400> 226

Ala Cys His Asp Cys Asn Gln Lys Lys Gly Asn Gln Asp Val Arg Ala

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

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

130 135 140

Thr Val Thr Ala Gly Lys Lys Leu Gly Ser Tyr Ile Gly Arg Val Leu
145 150 155 160

Cys Arg Ala Ser Gly Ser Phe Asp Ile Ala Thr Lys Thr Gly Arg Ile
165 170 175

Thr Gly Ile Ser His Lys Tyr Cys Asn Pro Ile His Lys Lys Asp Gly
180 185 190

Tyr Ser Tyr Ala Phe
195

<210
> 227
<211> 309
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-178 effector
<400> 227

Ala Glu Ile Ala Gly Val Gly Tyr Gln Gln Gly Thr Leu Ala Gly Tyr
1 5 10 15

Glu Leu Arg Glu Tyr Leu Leu Glu Lys Phe Asn Arg Thr Cys Cys Tyr
20 25 30

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

35 40 45

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

Pro Cys Asn Thr Lys Lys Gly Ala Arg Ser Ile Glu Ala Phe Leu Ala
65 70 75 80

Lys Asp Pro Ala Arg Leu Ala Arg Ile Arg Ala Gln Leu Lys Arg Pro
85 90 95

Leu Lys Asp Ala Ala Ala Val Asn Ala Thr Arg Trp Ala Leu Phe Glu

100 105 110

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

165 170 175
Cys Thr Gly Arg Gly Ser Tyr Gln Arg Thr Arg Leu Thr Gln Tyr Gly
180 185 190
Phe Ala Arg Gly Tyr Leu Met Arg Thr Lys Ser Val Lys Gly Phe Arg
195 200 205
Thr Gly Asp Leu Val Arg Ala Ser Val Thr Ser Gly Lys Lys Ile Gly
210 215 220
Glu Tyr Ile Gly Arg Val Ala Val Arg Ala Thr Gly Ser Phe Asn Ile

225 230 235 240
Gln Thr Val Gly Ala Val Val Gln Gly Val Ser His Lys Tyr Cys Arg
245 250 255
Ile Val Gln Arg Gly Asp Gly Tyr Gly Tyr Ala Trp Ser Ile Thr Pro
260 265 270
Phe Asn Thr Gly Lys Asn Asn Phe Pro Val Ser Ser His Pro Leu Ala
275 280 285
Ser Arg Ser Ala Leu Met Ser Leu Arg Asp Ser Ala Pro Lys Gly Gly

290 295 300
Tyr Pro Pro Glu Leu
305
<210> 228
<211> 345
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-179 effector

<400> 228

Ala Glu Leu Thr His Arg Gly Gln Ala Ile Lys Ala Ser Leu Glu Ser
1 5 10 15

Arg Arg Ser Leu Arg Arg Ser Arg Arg Asn Arg His Thr Arg Tyr Arg
20 25 30

Gln Ala Arg Phe Leu Asn Arg Thr Arg Pro Asp Gly Trp Leu Ala Pro
35 40 45

Ser Leu Gln His Arg Val Glu Thr Thr Leu Thr Trp Val Asn Lys Phe
50 55 60

Ile Gln Leu Ala Pro Ile Gly Ser Ile Val Gln Glu Leu Val Arg Phe
65 70 75 80

Asp Leu Gln Gln Ile Glu Asn Pro Glu Ile Ser Gly Ile Glu Tyr Gln
85 90 95

Gln Gly Glu Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu Leu Asn Lys
100 105 110

Trp Asp Arg Lys Cys Ala Tyr Cys Ser Ala Glu Asn Ile Pro Leu Gln
115 120 125

Val Glu His Ile His Ser Lys Ala Lys Gly Gly Ser Asn Arg Ile Ser
130 135 140

Asn Leu Cys Leu Ala Cys Glu Lys Cys Asn Leu Lys Lys Gly Thr Gln
145 150 155 160

Asp Ile Glu Val Phe Leu Ala Lys Lys Pro Asp Leu Leu Lys Arg Ile
165 170 175

Leu Ser Gln Ala Lys Arg Pro Leu Arg Asp Ala Ala Ala Val Asn Ser
180 185 190

Thr Arg Trp Ala Leu Leu Asn Arg Leu Gln Glu Thr Gly Leu Pro Val
195 200 205

Leu Thr Gly Ser Gly Gly Leu Thr Lys Phe Asn Arg Thr Arg Leu Asp
210 215 220

Leu Pro Lys Thr His Trp Leu Asp Ala Ala Cys Val Gly His Val Asp
225 230 235 240
Gln Leu Glu Val Leu Thr Gly Lys Pro Leu Leu Ile Lys Ala Thr Gly
245 250 255
His Gly Ser Arg Gln Met Cys Gly Thr Asp Lys Phe Gly Phe Pro Ser
260 265 270
Arg His Arg Thr Arg Lys Gln Ile His Gln Gly Phe Gln Thr Gly Asp

275 280 285
Ile Val Lys Ala Leu Val Thr Ser Gly Lys Lys Ile Gly Ser Tyr Gly
290 295 300
Gly Arg Val Leu Cys Arg Ala Ser Gly Ser Phe Asp Ile Gln Val Lys
305 310 315 320
Ser Gly Arg Val Gln Gly Leu Ser His Lys Phe Cys Arg Ser Val His
325 330 335
Arg Lys Asp Gly Tyr Gly Tyr Gly Phe
340 345

<210> 229
<211> 325
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-180 effector
<400> 229
Ala Asn Leu Arg Tyr Arg Gly Pro Arg Ile Leu Asn Arg Lys Asn Lys
1 5 10 15
Gly Lys Gly Trp Leu Ala Pro Ser Leu Gln His Arg Ile Asp Thr Thr
20 25 30
Leu Ser Trp Val Ala Arg Leu Arg Asn Val Ala Pro Val Thr His Leu

35 40 45
Ala Gln Glu Leu Val Arg Phe Asp Met Gln Gln Leu Glu Asn Pro Glu

50 55 60

Ile Ala Gly Val Glu Tyr Gln Gln Gly Glu Leu Val Gly Tyr Glu Val

65 70 75 80

Arg Glu Tyr Leu Leu Glu Lys Trp Arg Arg Gln Cys Ala Tyr Cys Asp

85 90 95

Ala Ser Thr Val Pro Leu Gln Ile Asp His Ile His Pro Lys Ala Arg

100 105 110

Gly Gly Ser Asn Arg Val Ser Asn Leu Thr Leu Ala Cys Ala Pro Cys

115 120 125

Asn Leu Arg Lys Ala Ala Gln Asp Val Thr Gln Phe Leu Glu Lys Asp

130 135 140

Pro Lys Arg Leu Ala Lys Ile Gln Ala Gln Ala Lys Arg Pro Leu Arg

145 150 155 160

Asp Ala Ala Val Val Asn Ala Thr Arg Trp Lys Leu Leu Asn Ala Leu

165 170 175

Lys Ala Thr Gly Leu Thr Val Arg Thr Gly Ser Gly Gly Leu Thr Lys

180 185 190

Cys Asn Arg Ser Lys Leu Gly Ile Pro Lys Thr His Ala Leu Asp Ala

195 200 205

Val Cys Ile Gly Glu Val Asp Gln Val Glu Gln Trp Gln Thr Pro Thr

210 215 220

Leu Glu Ile Lys Ala Thr Gly Arg Gly Ser Tyr Gln Arg Thr Arg Leu

225 230 235 240

Asn Arg Phe Gly Phe Pro Arg Gly Tyr Leu Ile Arg Gln Lys Arg Ile

245 250 255

His Gly Phe Gln Thr Gly Asp Arg Val Lys Ala Ile Val Thr Lys Gly

260 265 270

Lys Lys Val Gly Thr Tyr Met Gly Arg Val Ala Val Arg Asp Ser Gly

275 280 285

Ser Phe Asn Ile Gln Thr Ala Glu Gly Leu Val Gln Gly Ile Ser His

290 295 300

Arg Tyr Cys Thr Leu Ile Gln Arg Ser Asp Gly Tyr Gly Tyr Ser Leu
305 310 315 320
Arg Ser Asp Ser Asn
325

<210> 230
<211> 312
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-181 effector
<400> 230
Ala Pro Glu Thr Ala Ile Ser Thr Glu Leu Val Arg Phe Asp Met Gln

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

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

130 135 140
Thr Gly Gly Gln Thr Lys Phe Asn Arg Ser Gln Phe Asp Ile Pro Lys

145 150 155 160

Thr His Ala Leu Asp Ala Ala Cys Val Gly Glu Val Gly Ser Ile Thr

165 170 175

Asp Trp Gln Lys Pro Thr Leu Ala Ile Lys Ala Met Gly Arg Gly Ser

180 185 190

Tyr Gln Arg Thr Arg Leu Asp Lys Phe Gly Cys Val Arg Gly Tyr Leu

195 200 205

Thr Arg Ser Lys Ser Ile Lys Gly Phe Gln Thr Gly Asp Met Val Lys

210 215 220

Ala Glu Val Thr Thr Gly Lys Lys Ile Gly Ser Tyr Thr Gly Arg Val

225 230 235 240

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

245 250 255

Val Gln Gly Val Ser His Arg Tyr Cys Thr Val Val Gln Arg Gly Asn

260 265 270

Gly Tyr Gly Tyr Ser Leu Val Ala Lys Met Asp Val Thr Gly Thr Pro

275 280 285

Pro Gln His Arg Asp Ala Ser His Pro Ala Leu Tyr Leu Pro Gly Leu

290 295 300

Lys Ala Glu Val Ser Arg Ala Asn

305 310

<210> 231

<211> 228

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-183 effector

<400> 231

Ala Ser Asn Phe Thr Leu Ala Cys Ile Pro Cys Asn Gln Lys Lys Gly

1 5 10 15

Ala Gln Asp Ile Arg Val Phe Leu Ala Lys Asp Pro Arg Arg Leu Glu
20 25 30
Arg Ile Leu Ala Gln Ala Lys Lys Ser Leu Lys Asp Ala Ala Ala Val
35 40 45
Asn Ser Thr Arg Trp Ala Leu Leu Asn Ala Leu Lys Ala Thr Gly Leu

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

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

180 185 190
Ile Gln Arg Ala Asp Gly Tyr Gly Tyr Ser Trp Gln Ala Lys Ala Ser
195 200 205
Thr Ala Met Leu Ser Leu Leu His Leu Pro Ala Leu Asn Gly Gly Val
210 215 220
Ser Arg Arg Ile
225
<210> 232
<211> 406
<212> PRT
<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-184 effector

<400> 232

Ala Val Phe Val Ile Asp Arg Arg Gln Ala Pro Leu Met Pro Cys Ser
1 5 10 15

Glu Lys Arg Ala Arg Leu Leu Leu Ala Arg Gly Arg Ala Arg Val His
20 25 30

Arg Leu Ile Pro Phe Thr Ile Arg Leu Ile Asp Arg Ala Val Ala Gln
35 40 45

Ser Glu Leu Gln Pro Leu Glu Leu Lys Ile Asp Pro Gly Ser Lys Thr
50 55 60

Ser Gly Leu Ala Leu Val Arg Asn Arg Asp Thr Val Asn Ala Glu Thr
65 70 75 80

Gly Glu Ile Thr Ala Thr Ala His Val Leu Asn Leu Phe Glu Leu Ile
85 90 95

His Arg Gly Val Gln Ile Ser His Ala Leu Thr Ala Arg Arg Gln Met
100 105 110

Arg Arg Arg Arg Arg Ser Ala Asn Leu Arg Tyr Arg Ala Pro Arg Phe
115 120 125

Leu Asn Arg Lys Asn Lys Gly Lys Gly Trp Leu Ala Pro Ser Leu Gln
130 135 140

His Arg Ile Asp Thr Thr Leu Ser Trp Val Ala Arg Leu Arg Asn Val
145 150 155 160

Ala Pro Ile Thr His Leu Ala Gln Glu Leu Val Arg Phe Asp Met Gln
165 170 175

Gln Leu Glu Asn Pro Glu Ile Ala Gly Val Glu Tyr Gln Gln Gly Glu
180 185 190

Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys Cys Arg Arg
195 200 205

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

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

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

370 375 380
Ala Ile Val Thr Lys Gly Lys Lys Val Gly Thr Tyr Val Gly Arg Val
385 390 395 400
Ala Val Arg Ala Ser Gly
405

<210> 233
<211> 384
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-185 effector

<400> 233

Ala Val Val Asn Leu Phe Glu Leu Val His Arg Gly Arg Gln Ile Ser

1 5 10 15

Glu Ala Leu Thr Ala Arg Arg Gly His Arg Arg Leu Arg Arg Ser Lys

20 25 30

Leu Arg Tyr Arg Pro Pro Arg Phe Gly Asn Arg Gly Asn Gln Lys Lys

35 40 45

Gly Trp Leu Pro Pro Ser Leu Gln His Arg Val Asp Thr Gly Met Ala

50 55 60

Trp Val Ser Arg Ile Gln Arg Leu Ala Pro Val Ser Ala Ile Ser Thr

65 70 75 80

Glu Leu Val Arg Phe Asp Met Gln Ala Met Glu Asn Pro Glu Ile Glu

85 90 95

Gly Ala Gln Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu

100 105 110

Tyr Leu Leu Glu Lys Trp Asp Arg Thr Cys Ala Tyr Cys Gly Ala Lys

115 120 125

Asp Val Pro Leu Gln Ile Glu His Ile His Pro Lys Ser Lys Asn Gly

130 135 140

Ser Asp Arg Ile Asn Asn Leu Thr Leu Ala Cys Gln Cys Cys Asn Gln

145 150 155 160

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

165 170 175

Leu Leu Lys Arg Ile Leu Ala Gln Ala Lys Arg Pro Leu Lys Asp Ala

180 185 190

Ala Ala Val Asn Ser Thr Arg Trp Ala Leu Val Asn Thr Leu Lys Thr

195 200 205

Thr Gly Leu Val Val Glu Thr Gly Thr Gly Gly Gln Thr Lys Phe Asn

210 215 220

Arg Ser Gln Phe Asp Ile Pro Lys Thr His Ala Leu Asp Ala Ala Cys
225 230 235 240
Val Gly Glu Val Gly Ser Ile Thr Asp Trp Gln Lys Pro Thr Leu Ala
245 250 255
Ile Lys Ala Met Gly Arg Gly Ser Tyr Gln Arg Thr Arg Leu Asp Lys

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

325 330 335
Cys Thr Val Val Gln Arg Gly Asn Gly Tyr Gly Tyr Ser Leu Val Ala
340 345 350
Lys Thr Asp Val Arg Gly Thr Pro Pro Gln His Arg Ala Ala Lys His
355 360 365
Pro Ala Leu Tyr Leu Pro Gly Leu Lys Ala Glu Val Ser Arg Ala Asn
370 375 380
<210> 234
<211> 281
<212> PRT
<213> Unknown

<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-186 effector
<400> 234
Cys Ala Tyr Cys Pro Ala Thr Asn Val Pro Leu Gln Val Glu His Ile
1 5 10 15
Val Pro Arg Ala Lys Gly Gly Ser His Arg Val Ser Asn Leu Thr Leu

20 25 30

Ala Cys Gly Pro Cys Asn Thr Ala Lys Gly Thr Gln Asp Val Arg Ala

35 40 45

Phe Leu Ala Gln Asp Pro Lys Arg Leu Ala Arg Val Leu Ala Gln Ala

50 55 60

Lys Ala Pro Leu Arg Asp Ala Ala Ala Met Lys Leu Phe Thr Gln Ala

65 70 75 80

Glu Phe Asp Asn Leu Pro Val Ile Asp Gly Val Lys Gln Cys Pro Thr

85 90 95

Gly Asp Tyr Ser Ser Val Arg Asn Phe Gly Glu Arg Cys Val Phe Gly

100 105 110

Ala Glu Ser Ile Phe Cys Arg Asp Ser Arg Phe Ala Asp Ser Cys Ile

115 120 125

Phe Gly Glu Lys Ser Arg Phe Gly Val Gly Cys Ser Phe Cys Asp Arg

130 135 140

Cys Val Phe Gly Ile Gly Ile Arg Phe Glu Ile Trp Cys Lys Phe Gly

145 150 155 160

Leu Gly Cys Ile Phe Gly Ser Glu Thr Arg Phe Gly Asp Trp Cys Gly

165 170 175

Phe Gly Ala Glu Cys Val Phe Gly Asp Arg Cys Ala Phe Gly Val Gln

180 185 190

Asn Arg Phe Gly Glu Arg Cys Ile Phe Ala Gly Arg Arg Ala Leu Pro

195 200 205

Glu Asn Pro Leu Leu Val Phe Pro Gly Ala Gly Thr Asp Asp Arg Ile

210 215 220

Val Tyr Ala Ile Asn Val Glu Gly Gly Pro Trp Ile Glu Gly Trp Ser

225 230 235 240

Phe Ser Gly Gly Ile Asp Glu Phe Arg Ala Lys Val Arg Val Asn Gly

245 250 255

Gly Gly Leu Lys Ser Arg Tyr Leu Ser Val Ala Tyr Glu Val Ala Ala

260 265 270

Lys Trp Cys Pro Glu Lys Val Glu Ser
275 280

<210> 235

<211> 371

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-187 effector

<400> 235

Glu Glu Gly Glu Thr His His Val Leu His Leu Ala Glu Val His His
1 5 10 15

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

Arg Gly Arg Arg Ser Arg Lys Leu Arg His Arg Ala Pro Arg Phe Leu
35 40 45

Asn Arg Arg Arg Asp Asp Gly Trp Leu Ala Pro Ser Leu Gln His Arg
50 55 60

Val Leu Thr Thr Gln Thr Trp Val Lys Arg Tyr Arg Ala Leu Ala Pro
65 70 75 80

Ile Val Ala Leu Thr Val Glu Arg Val Arg Phe Asp Met Gln Gln Met
85 90 95

Val Thr Pro Glu Ile Ser Gly Val Glu Tyr Gln Gln Gly Thr Leu Ala
100 105 110

Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys Trp Gly Arg Thr Cys
115 120 125

Val Tyr Cys Asp His Thr Asp Arg Pro Leu Gln Val Glu His Leu Thr
130 135 140

Pro Pro Gly Ser Gly Gly Ser Asp Gln Gly Ser Asn Leu Ala Leu Ala
145 150 155 160

Cys Glu Ser Cys Asn Ala Ala Lys Gly Asn Gln Thr Val Glu Val Tyr

165 170 175

Leu Ala Asp Asp Pro Val Arg Arg Asp Arg Ile Leu Arg Gln Ala Gln

180 185 190

Gln Pro Leu Arg Asp Ala Ala Ala Val Asn Ala Thr Arg Trp Ala Ile

195 200 205

Trp Glu Ile Leu Thr Lys Thr Gly Leu Pro Val Glu Ser Thr Thr Gly

210 215 220

Gly Arg Thr Lys Trp Asn Arg Thr Arg Met Gly Ile Pro Lys Arg Asp

225 230 235 240

Ala Trp Asp Ala Ala Cys Ala Gly Thr Val Asp Gln Val Leu Gly Trp

245 250 255

Asp Arg Pro Ile Gln Arg Val Asp Cys Leu Gly Arg Gly Ser His Gln

260 265 270

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

275 280 285

Thr Lys Met Val Gln Trp Phe Arg Thr Trp Asp His Val Arg Ala Ile

290 295 300

Val Glu Thr Gly Ala His Arg Gly Thr Trp Thr Gly Arg Val Ala Val

305 310 315 320

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

325 330 335

Gly Ile Ala Ala Arg Trp Cys Val Leu Leu Gln Arg Gly Asp Gly Tyr

340 345 350

Arg Tyr Ser Leu Ala Leu Pro Arg Thr Glu His Ala Ile Arg Pro Ser

355 360 365

Ser Val Ala

370

<210> 236

<211> 416

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-188 effector

<400> 236

Glu Asn Cys Ala Phe Gln Ala Leu Arg Val Lys Leu Asp Pro Gly Ser
1 5 10 15

Lys Ala Thr Gly Ile Ala Leu Val Arg Glu Thr Glu Gly Lys Cys Val
20 25 30

Ala Val Val Asn Leu Phe Glu Leu Val His Arg Gly Arg Gln Ile Ser
35 40 45

Glu Ala Leu Thr Ala Arg Arg Gly His Arg Arg Leu Arg Arg Ser Lys
50 55 60

Leu Arg Tyr Arg Pro Pro Arg Phe Asp Asn Arg Gly Asn Gln Lys Lys
65 70 75 80

Gly Trp Leu Pro Pro Ser Leu Gln His Arg Val Asp Thr Ser Met Ala
85 90 95

Trp Val Ser Arg Ile Gln Arg Leu Ala Pro Val Ser Ala Ile Ser Thr
100 105 110

Glu Leu Val Arg Phe Asp Met Gln Ala Leu Glu Asn Pro Glu Ile Lys
115 120 125

Gly Ala Gln Tyr Gln Gln Gly Thr Leu Val Gly Tyr Glu Val Arg Glu
130 135 140

Tyr Leu Leu Glu Lys Trp Asp Arg Thr Cys Ala Tyr Cys Gly Ala Lys
145 150 155 160

Asp Val Pro Leu Gln Val Glu His Ile Gln Pro Lys Ala Lys Gly Gly
165 170 175

Ser Asn Arg Ile Ser Asn Leu Ala Leu Ala Cys Gln Cys Cys Asn Gln
180 185 190

Lys Lys Ala Ala Leu Pro Val Glu Met Phe Leu Ala Lys Lys Pro Glu
195 200 205

Leu Leu Lys Arg Ile Leu Ala Gln Ala Lys Arg Pro Leu Lys Asp Ala
210 215 220
Ala Ala Val Asn Ser Thr Arg Trp Ala Leu Val Asn Ala Leu Lys Ala
225 230 235 240

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

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

Cys Thr Val Val Gln Arg Gly Asn Gly Tyr Gly Tyr Ser Leu Val Ala
370 375 380
Lys Thr Asp Val Thr Gly Thr Pro Pro Gln His Arg Asp Ala Ser His
385 390 395 400
Pro Ala Leu Tyr Leu Pro Gly Leu Lys Ala Glu Val Ser Arg Glu Lys
405 410 415

<210> 237
<211> 438
<212> PRT
<213> Unknown
<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-189 effector

<400> 237

Glu Arg Gly Arg Ala Cys Val His Leu Val Met Pro Phe Thr Ile Arg
1 5 10 15

Ile Val Asp Leu Lys Ala Glu Asn Cys Ala Phe Gln Ala Leu Arg Val
20 25 30

Lys Leu Asp Pro Gly Ser Lys Ala Thr Gly Ile Ala Leu Val Arg Glu
35 40 45

Thr Glu Gly Lys Gly Val Ala Val Val Asn Leu Phe Glu Leu Val His
50 55 60

Arg Gly Arg Gln Ile Ser Glu Ala Leu Thr Ala Arg Arg Gly Asn Arg
65 70 75 80

Arg Leu Arg Arg Ser Lys Leu Arg Tyr Arg Pro Pro Arg Phe Asn Asn
85 90 95

Arg Gly Asn Lys Gln Arg Gly Trp Leu Ala Pro Ser Leu Gln His Arg
100 105 110

Val Asp Thr Ser Met Ala Trp Val Ser Arg Ile Gln Arg Leu Ala Pro
115 120 125

Val Ser Ala Ser Ser Ser Glu Leu Val Arg Phe Asp Ala Gln Ala Leu
130 135 140

Glu Asn Pro Glu Ile Glu Gly Ala Gln Tyr Gln Gln Gly Thr Leu Ala
145 150 155 160

Val Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys Trp Asp Arg Thr Cys
165 170 175

Ala Tyr Cys Gly Ala Lys Asp Val Pro Leu Gln Ile Glu His Ile Arg
180 185 190

Gln Lys Ser Lys Asn Gly Ser Asp Arg Ile Asn Asn Leu Thr Leu Ala
195 200 205

Cys Gln Cys Cys Asn Gln Lys Lys Ala Ala Leu Pro Val Glu Met Phe

210 215 220

Leu Ala Lys Lys Pro Glu Leu Leu Lys Arg Ile Leu Ala Gln Ala Lys

225 230 235 240

Arg Pro Leu Lys Asp Ala Ala Ala Val Asn Ser Thr Arg Trp Ala Leu

245 250 255

Val Asn Thr Leu Lys Thr Thr Gly Leu Val Val Glu Thr Gly Thr Gly

260 265 270

Gly Gln Thr Lys Phe Asn Arg Ser Gln Phe Asp Ile Pro Lys Thr His

275 280 285

Ala Leu Asp Ala Ala Cys Val Gly Glu Val Gly Ser Ile Thr Asp Trp

290 295 300

Gln Lys Pro Thr Leu Ala Ile Lys Ala Met Gly Arg Gly Arg Tyr Gln

305 310 315 320

Arg Thr Arg Leu Asp Lys Phe Gly Cys Val Arg Gly Tyr Leu Ile Arg

325 330 335

Ser Lys Ser Ile Lys Gly Phe Gln Thr Gly Asp Met Val Lys Ala Glu

340 345 350

Val Thr Thr Gly Lys Lys Ile Gly Ser Tyr Thr Gly Arg Val Ala Val

355 360 365

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

370 375 380

Gly Val Ser His Arg Tyr Cys Thr Val Val Gln Arg Gly Asn Gly Tyr

385 390 395 400

Gly Tyr Ser Leu Val Ala Lys Thr Asp Val Arg Gly Thr Pro Pro Gln

405 410 415

His Arg Asp Ala Ser His Pro Ala Leu Tyr Leu Pro Gly Leu Lys Ala

420 425 430

Glu Val Ser Arg Ala Asn

435

<210> 238

<211> 267

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-190 effector

<400> 238

Glu Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu
1 5 10 15

Leu Glu Lys Trp Gly Arg Thr Cys Val Tyr Cys Asp His Thr Asp Arg
20 25 30

Pro Leu Gln Val Glu His Leu Thr Pro Thr Gly Ser Gly Gly Ser Asp

35 40 45

Gln Val Ser Asn Leu Ala Leu Ala Cys Glu Ser Cys Asn Ala Ala Lys
50 55 60

Gly Asn Gln Thr Val Glu Val Tyr Leu Ala Asp Asp Pro Val Arg Arg
65 70 75 80

Asp Arg Ile Leu Arg Gln Ala Gln Gln Pro Leu Arg Asp Ala Ala Ala
85 90 95

Val Asn Ala Thr Arg Trp Ala Ile Trp Glu Met Leu Thr Arg Thr Gly

100 105 110

Val Pro Val Glu Ala Thr Thr Gly Gly Arg Thr Lys Trp Asn Arg Thr
115 120 125

Arg Met Gly Ile Pro Lys Arg Asp Ala Trp Asp Ala Ala Cys Ala Gly
130 135 140

Thr Val Asp Gln Val Leu Gly Trp Asp Arg Pro Ile Gln Arg Val Asp
145 150 155 160

Cys Leu Gly Arg Gly Ser His Gln Arg Thr Arg Val Thr Lys Asp Gly

165 170 175

Phe Pro Arg Gly Tyr Leu Pro Arg Thr Lys Met Val Gln Gly Phe Arg
180 185 190

Thr Gly Asp His Val Arg Ala Ile Val Glu Thr Gly Ala His Arg Gly

195 200 205

Thr Trp Thr Gly Arg Val Ala Val Arg Ser Thr Gly Ser Phe Asn Ile

210 215 220

Gln Thr Gly Ala Ala Thr Ile Gln Gly Ile Ala Ala Arg Trp Cys Val

225 230 235 240

Leu Leu Gln Arg Gly Asp Gly Tyr Arg Tyr Ser Leu Ala Leu Pro Arg

245 250 255

Thr Glu His Ala Ile Arg Pro Ser Ser Val Ala

260 265

<210> 239

<211> 346

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-191 effector

<400> 239

Phe Asp Asn Arg Gly Asn Lys Gln Arg Gly Trp Leu Ala Pro Ser Leu

1 5 10 15

Gln His Arg Val Asp Thr Ser Met Ala Trp Val Ser Arg Ile Gln Arg

20 25 30

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

35 40 45

Gln Ala Met Glu Asn Pro Glu Ile Glu Gly Ala Gln Tyr Gln Gln Gly

50 55 60

Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys Trp Asp

65 70 75 80

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

85 90 95

His Ile His Pro Lys Ser Lys Asn Gly Ser Asp Arg Ile Asn Asn Leu

100 105 110

Thr Leu Ala Cys Gln Cys Cys Asn Gln Lys Lys Ala Ala Leu Pro Val
115 120 125
Glu Met Phe Leu Ala Lys Lys Pro Glu Leu Leu Lys Arg Ile Leu Ala

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

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

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

325 330 335
Leu Lys Ala Glu Val Ser Arg Ala Asn Arg
340 345

<210> 240

<211> 346

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-192 effector

<400> 240

Phe Gly Ala Glu Leu Thr His Arg Gly Gln Thr Ile Lys Ala Ser Leu
1 5 10 15
Glu Ser Arg Arg Ser Leu Arg Arg Gly Arg Arg Asn Arg His Thr Arg

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

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

145 150 155 160
Thr Gln Asn Ile Glu Gln Phe Leu Ala Lys Lys Pro Asp Ile Leu Ser
165 170 175
Arg Ile Leu Thr Gln Ser Lys Arg Pro Leu Lys Asp Ala Ala Ala Val
180 185 190

Asn Ser Thr Arg Trp Thr Leu Phe Gly Arg Leu Lys Glu Thr Gly Leu
195 200 205
Pro Val Leu Thr Gly Ser Gly Gly Leu Thr Lys Phe Asn Arg Ser Arg

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

275 280 285
Gly Asp Ile Val Lys Ala Ile Val Ile Ser Gly Lys Lys Ile Gly Glu
290 295 300
Tyr Val Gly Arg Val Ala Val Arg Thr Thr Gly Ser Phe Asn Ile Ser
305 310 315 320
Ala Ser Glu Leu Val Gln Gly Ile Ser His Lys Tyr Cys Lys Ile Val
325 330 335
His Lys Lys Asp Gly Tyr Ser Tyr Ala Tyr
340 345

<210> 241
<211> 82
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-193 effector
<400> 241
Phe Thr Ile Ile Leu Thr Glu Arg Glu Asp Gly Glu Thr Gln Glu Val
1 5 10 15
Glu Leu Lys Val Asp Pro Gly Ser Lys Thr Ser Gly Met Ala Leu Val

20 25 30

Ala Thr Cys Lys Arg Gly Lys Lys Val Ile Phe Ala Ala Asn Leu Glu

35 40 45

His Arg Gly His Thr Ile Lys Lys Val Ala Arg Phe Gln Thr Arg Cys

50 55 60

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

65 70 75 80

Phe Lys

<210> 242

<211> 407

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220

><223> Description: MG35-194 effector

<400> 242

Phe Thr Ile Arg Leu Ile Asp Arg Ala Val Ala Gln Ser Glu Leu Gln

1 5 10 15

Pro Leu Glu Leu Lys Ile Asp Pro Gly Arg Lys Thr Ser Gly Leu Ala

20 25 30

Leu Val Arg Asn Arg Asn Thr Val Asn Ala Glu Thr Gly Glu Ile Thr

35 40 45

Ala Thr Thr His Val Leu Asn Leu Phe Glu Leu Ile His Arg Gly Val

50 55 60

Gln Ile Ser His Ala Leu Thr Ala Arg Arg Gln Met Arg Arg Arg Arg

65 70 75 80

Arg Ser Ala Asn Leu Arg Tyr Arg Ala Pro Arg Phe Leu Asn Arg Lys

85 90 95

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

100 105 110

Thr Thr Leu Ser Trp Val Ala Arg Leu Arg Asn Val Ala Pro Ile Thr

115 120 125

His Leu Ala Gln Glu Leu Val Arg Phe Asp Met Gln Gln Leu Glu Asn

130 135 140

Pro Glu Ile Ala Gly Val Glu Tyr Gln Gln Gly Glu Leu Ala Gly Tyr

145 150 155 160

Glu Val Arg Glu Tyr Leu Leu Glu Lys Trp Arg Arg Gln Cys Ala Tyr

165 170 175

Cys Asp Ala Ser Thr Val Pro Leu Gln Ile Asp His Ile His Pro Lys

180 185 190

Ala Arg Gly Gly Ser Asn Arg Val Ser Asn Leu Thr Leu Ala Cys Ala

195 200 205

Pro Cys Asn Leu Arg Lys Ala Ala Gln Asp Val Thr Gln Phe Leu Glu

210 215 220

Lys Asp Pro Lys Arg Leu Ala Lys Ile Gln Ala Gln Ala Lys Arg Pro

225 230 235 240

Leu Arg Asp Ala Ala Ala Val Asn Ala Thr Arg Trp Lys Leu Leu Asn

245 250 255

Ala Leu Lys Ala Thr Gly Leu Thr Asn Arg Thr Gly Ser Gly Gly Leu

260 265 270

Thr Lys Phe Asn Arg Ser Arg Leu Val Ile Pro Lys Thr His Ala Leu

275 280 285

Asp Ala Val Cys Val Gly Glu Val Asp Phe Val Glu Gln Trp Gln Lys

290 295 300

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

305 310 315 320

Arg Leu Asn Arg Phe Gly Phe Pro Arg Gly Tyr Leu Thr Arg Gln Lys

325 330 335

Arg Thr Gln Gly Phe Gln Thr Gly Asp Met Val Lys Ala Ile Val Thr

340 345 350

Lys Gly Lys Lys Val Gly Thr Tyr Val Gly Arg Val Ala Val Arg Ala

355 360 365

Ser Gly Ser Phe Asn Ile Gln Ser Ala Glu Gly Leu Val Gln Gly Ile

370 375 380

Ser His Arg Tyr Cys Thr Leu Ile Gln Arg Ser Asp Gly Tyr Gly Tyr

385 390 395 400

Ser Thr Arg Ile Asp Ser Phe

405

<210> 243

<211> 134

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-195 effector

<400> 243

Gly Gln Thr Lys Phe Asn Arg Asn Arg Leu Gly Leu Pro Lys Ser His

1 5 10 15

Trp Leu Asp Ala Ala Cys Val Gly Asn Ile Glu Ala Glu Ala Leu Phe

20 25 30

Val Leu Ile Ser Lys Pro Leu Leu Ile Val Ala Thr Gly His Gly Arg

35 40 45

Arg Gln Met Cys Gly Thr Asn Lys Tyr Gly Phe Pro Thr Arg His Lys

50 55 60

Ser Arg Val Gln Ile His Lys Gly Phe Gly Thr Gly Asp Ile Val Ser

65 70 75 80

Pro Thr Val Thr Ala Gly Lys Lys Val Gly Tyr Tyr Val Gly Arg Val

85 90 95

Leu Cys Arg Ala Ser Gly Ser Phe Asp Ile Ala Thr Lys Thr Gly Arg

100 105 110

Val Ala Gly Ile Ser His Lys Tyr Cys Ser Pro Ile His Lys Lys Asp

115 120 125

Gly Tyr Ser Tyr Ala Phe
130

<210> 244
<211> 79
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-196 effector
<400> 244
Gly Ser Tyr Thr Gly Arg Val Ala Val Arg Ala Thr Gly Ser Phe Asn
1 5 10 15
Ile Gln Thr Ser Thr Gly Leu Val Gln Gly Val Ser His Arg Tyr Cys
20 25 30
Thr Val Val Gln Arg Gly Asn Gly Tyr Gly Tyr Ser Gln Val Ala Lys
35 40 45
Met Asp Val Thr Gly Thr Pro Pro Gln His Arg Asp Ala Ser His Pro
50 55 60
Ala Leu Tyr Leu Pro Gly Leu Lys Ala Glu Val Ser Arg Ala Asn
65 70 75
<210> 245
<211> 269
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-197 effector

<400> 245
Gly Val Glu Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu
1 5 10 15

Tyr Leu Leu Glu Lys Trp Gly Arg Thr Cys Val Tyr Cys Asp His Thr
20 25 30
Asp Arg Pro Leu Gln Val Glu His Leu Thr Pro Thr Gly Ser Gly Gly
35 40 45
Ser Asp Gln Val Ser Asn Leu Ala Leu Ala Cys Glu Ser Cys Asn Ala
50 55 60

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

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

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

Pro Arg Thr Glu His Ala Ile Arg Pro Ser Ser Val Ala

260 265

<210> 246

<211> 387

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-198 effector

<400> 246

Ile Ala Leu Val Arg Glu Thr Glu Gly Lys Gly Val Ala Val Val Asn
1 5 10 15

Leu Phe Glu Leu Val His Arg Gly Arg Gln Ile Ser Glu Ala Leu Thr

20 25 30

Ala Arg Arg Gly His Arg Arg Leu Arg Arg Ser Lys Leu Arg Tyr Arg
35 40 45

Pro Pro Arg Phe Asp Asn Arg Gly Asn Lys Gln Arg Gly Trp Leu Ala
50 55 60

Pro Ser Leu Gln His Arg Val Asp Thr Ser Met Ala Trp Val Ser Arg
65 70 75 80

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

85 90 95

Phe Asp Met Gln Ala Met Glu Asn Pro Glu Ile Glu Gly Ala Gln Tyr
100 105 110

Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu
115 120 125

Lys Trp Asp Arg Thr Cys Ala Tyr Cys Gly Ala Lys Asp Val Pro Leu
130 135 140

Gln Ile Glu His Ile His Pro Lys Ser Lys Asn Gly Ser Asp Arg Ile

145 150 155 160

Asn Asn Leu Thr Leu Ala Cys Gln Cys Cys Asn Gln Lys Lys Ala Ala

165 170 175

Leu Pro Val Glu Met Phe Leu Ala Lys Lys Pro Glu Leu Leu Lys Arg
180 185 190
Ile Leu Ala Gln Ala Lys Arg Pro Leu Lys Asp Ala Ala Ala Val Asn
195 200 205
Ser Thr Arg Trp Ala Leu Val Asn Thr Leu Lys Thr Thr Gly Leu Val

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

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

340 345 350
Gln Arg Gly Asn Gly Tyr Gly Tyr Ser Leu Val Ala Lys Met Asp Val
355 360 365
Thr Gly Thr Pro Pro Gln Arg Arg Asp Ala Ser Ser Arg Ala Leu Pro
370 375 380
Pro Pro Asp
385

<210> 247
<211> 382
<212> PRT
<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-199 effector

<400> 247

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

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

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

            180                 185                 190
Lys Ala Ala Gln Asp Ile Ala Leu Phe Leu Ala Lys Asp Pro Lys Arg
        195                 200                 205
```

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

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

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

370 375 380
<210> 248
<211> 94
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-200 effector
<400> 248
Ile Glu Gln Lys Ser Asp Ser Leu Glu Glu Phe Arg Glu Ala Tyr Gly

1 5 10 15

Asp Ala Ala Val Ser Gln Leu Thr Val Arg Pro His Leu Pro Gln Tyr

20 25 30

Lys Asp Met Asn Arg Ile Met Pro Gly Ala Val Met Asp Phe Asp Gly

35 40 45

Ala Val Gly Val Phe Gln Gly Ser Ser Gly Arg Asn Asn Gly Thr Pro

50 55 60

Asn Tyr Tyr Asn Ser Thr Lys Gly Ala Arg Val Leu Thr Lys Arg Cys

65 70 75 80

Ala Leu Leu Ala Lys Asn Ile Gly Met Val Phe Ile Pro Ala

85 90

<210> 249

<211> 410

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-201 effector

<400> 249

Ile Leu Thr Pro Cys Lys Pro Ser Met Ala His Lys Leu Leu Thr Ala

1 5 10 15

Gly Lys Ala Ile Val Phe Arg Arg Phe Pro Phe Thr Ile Ile Leu Lys

20 25 30

Lys Thr Val Thr Ala Thr Pro Glu Ser Ile Thr Leu Lys Met Asp Pro

35 40 45

Gly Ser Lys Thr Thr Gly Leu Ala Leu Leu Glu Gly Glu Lys Val Ile

50 55 60

Phe Gly Ala Glu Leu Thr His Arg Gly Gln Thr Ile Lys Ala Ser Leu

65 70 75 80

Asp Ser Arg Arg Ala Leu Arg Arg Gly Arg Arg Ser Arg His Thr Arg

85 90 95

Tyr Arg Gln Ala Arg Phe Leu Asn Arg Thr Arg Lys Glu Gly Trp Leu

100 105 110

Val Pro Ser Leu Gln His Arg Val Glu Thr Thr Leu Thr Trp Val Asn

115 120 125

Lys Leu Arg Arg Leu Ala Pro Ile Ser Leu Ile Val Gln Glu Leu Val

130 135 140

Arg Phe Asp Leu Gln Gln Leu Glu Asn Pro Glu Ile Ser Gly Ile Glu

145 150 155 160

Tyr Gln Gln Gly Glu Leu Gln Gly Tyr Glu Val Arg Glu Tyr Leu Leu

165 170 175

Asn Lys Trp Asn Arg Lys Cys Ala Tyr Cys Asp Ala Glu His Val Pro

180 185 190

Leu Gln Val Glu His Ile His Pro Lys Ala Lys Gly Gly Ser Asn Arg

195 200 205

Ile Ser Asn Leu Cys Leu Ala Cys Glu Lys Cys Asn Ile Lys Lys Ser

210 215 220

Thr Gln Asn Ile Glu Gln Phe Leu Thr Lys Lys Pro Asp Ile Leu Lys

225 230 235 240

His Ile Leu Ala Gln Ala Lys Arg Pro Leu Lys Asp Ala Ala Ala Val

245 250 255

Asn Ser Thr Arg Trp Val Leu Phe Ser Arg Leu Lys Glu Thr Gly Leu

260 265 270

Pro Val Leu Thr Gly Ser Gly Gly Leu Thr Lys Phe Asn Arg Thr Arg

275 280 285

Leu Lys Leu Pro Lys Thr His Trp Leu Asp Ala Ala Cys Val Gly Gln

290 295 300

Ile Glu Ser Pro Glu Val Leu Thr Asn Lys Pro Leu Leu Ile Lys Ala

305 310 315 320

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

325 330 335

Pro Ser Arg Tyr Phe Pro Arg Asn Lys Phe Val Lys Gly Phe Gln Thr

340 345 350

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

355 360 365

Tyr Val Gly Arg Val Ala Val Arg Ser Thr Gly Ser Phe Asn Ile Ser

370 375 380

Ala Ser Glu Leu Val Gln Gly Ile Ser His Lys Tyr Cys Lys Thr Val

385 390 395 400

His His Lys Asp Gly Tyr Ser Tyr Ser Phe

405 410

<210> 250

<211> 126

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-202 effector

<400> 250

Ile Pro Lys Thr His Ala Leu Asp Ala Ala Cys Val Gly Glu Val Asp

1 5 10 15

Phe Val Glu Gln Trp Gln Lys Pro Thr Leu Ala Ile Lys Ala Thr Gly

20 25 30

Arg Gly Ser Tyr Gln Arg Thr Arg Leu Thr Arg Phe Gly Phe Pro Arg

35 40 45

Gly Ser Leu Thr Arg Gln Lys Arg Ile His Ala Phe Gln Thr Gly Asp

50 55 60

Met Val Lys Ala Ile Val Thr Lys Gly Lys Lys Val Gly Thr Tyr Val

65 70 75 80

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

85 90 95

Glu Gly Leu Val Gln Gly Ile Ser His Arg Tyr Cys Thr Leu Ile Gln

100 105 110

Arg Ser Asp Gly Tyr Gly Tyr Ser Thr Arg Ile Asp Ser Phe

115 120 125

<210> 251

<211> 338

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-203 effector

<400> 251

Ile Arg Asp Ala Leu Thr Ser Arg Arg Gln Leu Arg Arg Ser Arg Arg

1 5 10 15

Asn Arg Lys Thr Arg Tyr Arg Lys Ser Arg Phe Leu Asn Arg Thr Arg

20 25 30

Pro Glu Gly Trp Leu Pro Pro Ser Leu Asn Ser Arg Val Ala Asn Ile

35 40 45

Leu Thr Trp Val Asn Arg Leu Ser Ser Ile Ser Gln Ile Thr Ala Ile

50 55 60

Ser Gln Glu Leu Val Arg Phe Asp Thr Gln Gln Met Glu Asp Ala Glu

65 70 75 80

Ile Ser Gly Ile Gly Tyr Gln Gln Gly Thr Leu Phe Gly Tyr Glu Ile

85 90 95

Arg Glu Phe Leu Leu Glu Lys Trp Asn Arg Thr Cys Ala Tyr Cys Gly

100 105 110

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

115 120 125

Gly Gly Ser Asn Arg Ile Ser Asn Leu Cys Leu Ala Cys Thr Ser Cys

130 135 140

Asn Gln Lys Lys Gly Asn Gln Asp Ile Lys Asp Phe Leu Lys Gly Lys

145 150 155 160

Pro Asp Leu Leu Lys Cys Ile Leu Ser Gln Ala Lys Arg Pro Leu Ala
165 170 175
Asp Thr Ala Ala Val Asn Ala Thr Arg Trp Asn Leu Tyr Tyr Asn Leu
180 185 190
Lys Lys Thr Gly Leu Pro Val Glu Val Gly Thr Gly Gly Arg Thr Lys
195 200 205
Tyr Asn Arg Thr Ile Arg Gly Leu Asp Lys Thr His Tyr Trp Asp Ala
210 215 220

Ala Cys Val Gly Ala Ser Thr Pro Glu Gln Leu Ile Thr Ser Glu Val
225 230 235 240
Lys Pro Leu Leu Ile Ala Ala Lys Gly His Gly Thr Arg Gln Gln Cys
245 250 255
Arg Thr Asp Arg Phe Gly Phe Pro Ser Arg Tyr Cys Lys Arg Thr Lys
260 265 270
Phe His Lys Gly Phe Gln Thr Gly Asp Ile Val Lys Ala Val Val Thr
275 280 285

Ser Gly Lys Lys Ile Gly Thr Tyr Val Gly Arg Val Ala Thr Arg Ala
290 295 300
Thr Gly Ser Phe Asn Ile Ser Thr Thr Asp Gly Leu Val Gln Gly Ile
305 310 315 320
Ser His Lys Tyr Cys Leu Pro Leu His Lys Lys Asp Gly Tyr Ser Tyr
325 330 335
Ile Gln

<210> 252
<211> 467
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors
<220><223> Description: MG35-204 effector

<400> 252

Lys Glu Lys Lys Ala Arg Val Val Ser Arg Thr Pro Phe Thr Ile Arg
1 5 10 15

Leu Asn Tyr Asp Thr Pro Asn Ile Thr Gln Asp Leu Ile Leu Gly Ile
20 25 30

Asp Pro Gly Arg Thr Asn Ile Gly Gly Ala Val Val Lys Glu Asp Gly
35 40 45

Ser Cys Val Phe Ser Ala His Leu Glu Thr Arg Asn Lys Glu Val Pro
50 55 60

Leu Leu Met Lys Lys Arg Ala Ala Phe Arg Arg Gln His Arg Thr Gln
65 70 75 80

Asp Arg Arg Arg Lys Arg Gln Arg Arg Ala Ile Ala Ala Gly Thr Thr
85 90 95

Val Glu Ser Asn Thr Val Glu Arg Leu Leu Pro Ser Tyr Glu Lys Pro
100 105 110

Val Val Cys His Tyr Ile Arg Asn Lys Glu Ala Arg Phe Asn Asn Arg
115 120 125

Ser Arg Pro Ala Gly Trp Leu Thr Pro Thr Ala Asn His Leu Leu Gln
130 135 140

Thr His Ile Asn Leu Ile Ala Lys Ile Ala Lys Val Leu Pro Ile Thr
145 150 155 160

Lys Val Val Val Glu Leu Asn Arg Phe Ala Phe Met Ala Met Asp Asn
165 170 175

Pro Asn Ile Arg Arg Trp Glu Tyr Gln Gln Gly Pro Leu Cys Gly Leu
180 185 190

Gly Ser Val Glu Asp Ala Val Tyr Ala Gln Gln Asp Gly His Cys Leu
195 200 205

Phe Cys Lys Lys Pro Ile Asp His Tyr His His Val Val Pro Arg Arg
210 215 220

Lys Asn Gly Ser Glu Thr Leu Ala Asn Arg Cys Gly Leu Cys Ala Lys
225 230 235 240

His His Ala Leu Val His Thr Asp Lys Ala Trp Ala Asp Lys Leu Val

245 250 255

Thr Arg Lys Glu Gly Met Asn Lys Lys Tyr His Ala Leu Ser Val Leu

260 265 270

Asn Gln Ile Val Pro His Leu Met Glu Tyr Leu Gly Asp Glu Thr Leu

275 280 285

Tyr Asp Val Tyr Ala Thr Asp Gly Arg Ser Thr Lys Gly Phe Arg Ile

290 295 300

Ala Lys Asn Val Pro Lys Glu His Tyr Thr Asp Ala Tyr Cys Ile Ala

305 310 315 320

Cys Ser Ile Leu Asp Thr Asp Thr Lys Val Ser Ala Pro Val Glu Pro

325 330 335

Phe Glu Leu Lys Gln Phe Arg Arg His Asp Arg Gln Ala Cys His Gln

340 345 350

Gln Arg Val Asp Arg Lys Tyr Tyr Leu Asn Gly Lys Gln Val Ala Thr

355 360 365

Asn Arg His Lys Ala Ile Glu Gln Lys Ser Asp Ser Leu Gln Glu Phe

370 375 380

Arg Glu Ser Tyr Gly Asp Thr Ala Val Ser Gln Leu Ala Val Lys Pro

385 390 395 400

His Ser Pro Gln Tyr Lys Asp Met Thr Arg Ile Met Gln Gly Ala Val

405 410 415

Met Asp Phe Gly Gly Thr Val Gly Val Phe Gln Gly Ser Asp Gly Phe

420 425 430

His Asn Gly Lys Pro Asp Tyr Tyr Lys Ser Ala Lys Gly Ala Arg Val

435 440 445

Leu Thr Lys Arg Cys Val Leu Leu Ala Gln Asn Thr Gly Ile Val Phe

450 455 460

Ile Pro Ala

465

<210> 253

<211> 467

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-205 effector

<400> 253

Lys Glu Lys Lys Ala Arg Val Val Ser Arg Thr Pro Phe Thr Ile Arg
1 5 10 15

Leu Asn Tyr Asp Thr Pro Asn Ile Thr Gln Asp Leu Ile Leu Gly Ile
20 25 30

Asp Pro Gly Arg Thr Asn Ile Gly Val Ala Val Val Lys Glu Asp Gly
35 40 45

Gln Cys Val Phe Ser Ala His Leu Glu Thr Arg Asn Lys Glu Val Pro
50 55 60

Leu Leu Met Lys Lys Arg Ala Ala Phe Arg Arg Asn His Arg Thr Leu
65 70 75 80

Asp Arg Arg Arg Lys Arg Gln Arg Arg Ala Ile Ala Ala Gly Thr Thr
85 90 95

Val Glu Ser Asn Thr Ile Glu Arg Leu Leu Pro Gly Tyr Glu Lys Pro
100 105 110

Val Val Cys His Tyr Ile Arg Asn Lys Glu Ala Arg Phe Asn Asn Arg
115 120 125

Ser Arg Pro Ala Gly Trp Leu Thr Pro Thr Ala Asn His Leu Leu Gln
130 135 140

Thr His Ile Asn Leu Ile Ala Lys Ile Ala Lys Phe Leu Pro Ile Thr
145 150 155 160

Lys Val Val Val Glu Leu Asn Arg Phe Ala Phe Met Ala Met Asp Asn
165 170 175

Pro Asn Ile Arg Arg Trp Glu Tyr Gln Gln Gly Ser Leu Tyr Gly Leu
180 185 190

Gly Ser Val Glu Asp Ala Val Tyr Ala Gln Gln Asp Gly His Cys Leu
195 200 205

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

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

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

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

435 440 445

Arg Met Arg Arg Cys Ala Leu Leu Ala Gln Asn Ala Gly Met Val Phe

450 455 460

Ile Pro Ala

465

<210> 254

<211> 504

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-206 effector

<400> 254

Lys Gly Lys Gly Ser Lys Val Leu Val Ala Thr His Lys Ser Arg Ser

1 5 10 15

Arg Leu Leu Thr Phe Pro Arg Gly Asp Trp Ser Gln Gly Gln Arg Asn

20 25 30

Lys Ser Arg Lys Gly Glu Gly Phe Glu Met Thr Val Phe Val Leu Asp

35 40 45

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

50 55 60

Leu Leu Glu Arg Gly Arg Ala Cys Val His Leu Val Met Pro Phe Thr

65 70 75 80

Ile Arg Ile Val Asp Leu Lys Ala Glu Asn Cys Ala Phe Gln Ala Leu

85 90 95

Arg Val Lys Leu Asp Pro Gly Ser Lys Ala Thr Gly Ile Ala Leu Val

100 105 110

Arg Glu Thr Glu Gly Lys Gly Val Ala Val Val Asn Leu Phe Glu Leu

115 120 125

Val His Arg Gly Arg Gln Ile Ser Glu Ala Leu Thr Ala Arg Arg Gly

130 135 140

His Arg Arg Leu Arg Arg Ser Lys Leu Arg Tyr Arg Pro Pro Arg Phe
145 150 155 160
Asn Asn Arg Gly Asn Lys Gln Arg Gly Trp Leu Ala Pro Ser Leu Gln

165 170 175
His Arg Val Asp Thr Ser Met Ala Trp Val Ser Arg Ile Gln Arg Leu
180 185 190
Ala Pro Val Ser Ala Ile Ser Thr Glu Leu Val Arg Phe Asp Met Gln
195 200 205
Ala Met Glu Asn Pro Glu Ile Glu Gly Met Gln Tyr Gln Gln Gly Thr
210 215 220
Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys Trp Lys Arg

225 230 235 240
Thr Cys Ala Tyr Cys Asp Ala Lys Asp Val Pro Leu Gln Val Glu His
245 250 255
Ile Gln Pro Lys Ala Lys Gly Gly Ser Asn Arg Ile Ser Asn Leu Ala
260 265 270
Leu Ala Cys Pro Ser Cys Asn Ser Lys Lys Ala Ala Leu Pro Ile Glu
275 280 285
Ser Phe Leu Ser Lys Gln Pro Glu Arg Leu Lys Arg Ile Gln Val Gln

290 295 300
Ala Lys Arg Pro Leu Lys Asp Ala Ala Ala Val Asn Ser Thr Arg Trp
305 310 315 320
Ala Leu Val Asn Ala Leu Lys Ala Thr Gly Leu Pro Val Glu Thr Ala
325 330 335
Ser Gly Gly Gln Thr Lys Phe Asn Arg Ser Gln Phe Asp Ile Pro Lys
340 345 350
Thr His Ala Leu Asp Ala Ala Cys Val Gly Glu Val Gly Ser Ile Thr

355 360 365
Asp Trp Gln Lys Pro Thr Leu Val Ile Lys Ala Met Gly Arg Gly Ser
370 375 380
Tyr Gln Arg Thr Arg Leu Asp Lys Phe Gly Cys Val Arg Gly Tyr Leu

385 390 395 400

Thr Arg Ser Lys Ser Ile Lys Gly Phe Gln Thr Gly Asp Met Val Gln

405 410 415

Ala Glu Val Thr Lys Gly Lys Lys Ile Gly Ser Tyr Thr Gly Arg Val

420 425 430

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

435 440 445

Val Gln Gly Val Ser His Arg Tyr Cys Thr Val Val Gln Arg Gly Asn

450 455 460

Gly Tyr Gly Tyr Ser Leu Val Ala Lys Thr Asp Val Arg Gly Thr Pro

465 470 475 480

Pro Gln His Arg Asp Ala Ser His Pro Ala Leu Tyr Leu Pro Gly Leu

485 490 495

Lys Ala Glu Val Ser Arg Ala Asn

500

<210> 255

<211> 378

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-207 effector

<400> 255

Lys Ile Asp Pro Gly Ser Lys Thr Thr Gly Leu Ala Leu Val Asn Asp

1 5 10 15

Glu Ser Gly Ala Val Val Phe Ala Ala Asp Leu Ala His Arg Gly Gln

20 25 30

Gln Ile Lys Lys Gly Leu Asp Thr Arg Arg Gly Ala Arg Arg Gly Arg

35 40 45

Arg Gln Arg Lys Thr His Tyr Arg Ala Pro Arg Trp Arg Asn Arg Arg

50 55 60

Arg Glu Gln Gly Trp Leu Pro Pro Ser Leu Leu Ser Arg Ile Cys Asn
65 70 75 80
Val Val Thr Trp Val Glu Arg Leu Arg Arg Leu Ala Pro Ile Gln Ala

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

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

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

275 280 285
Arg Asn Val Asn Lys Ile Gly Leu Pro Cys Ser Ala Pro Lys Gly Pro
290 295 300
Lys Lys Val Gln Gly Phe Gln Thr Gly Asp Ile Thr Arg Ala Ile Val

305 310 315 320

Thr Thr Gly Lys Lys Gln Gly Ile Tyr Val Gly Arg Val Leu Val Arg

325 330 335

Ala Thr Gly Ser Phe Asp Ile Thr Thr Arg Arg Thr Arg Ile Ala Gly

340 345 350

Leu Asp Val Arg Phe Phe Ser His Leu His Arg Ser Asp Gly Tyr Ser

355 360 365

Tyr Ala Lys Gly Glu Gly Tyr Ala Asn Pro

370 375

<210> 256

<211> 444

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-208 effector

<400> 256

Leu Ala Leu Leu Leu Leu Glu Arg Gly Arg Ala Cys Val His Leu Val

1 5 10 15

Met Pro Phe Thr Ile Arg Ile Val Asp Leu Lys Ala Glu Asn Cys Ala

20 25 30

Phe Gln Ala Leu Arg Val Lys Leu Asp Pro Gly Ser Lys Ala Thr Gly

35 40 45

Ile Ala Leu Val Arg Glu Thr Glu Gly Lys Gly Val Ala Val Val Asn

50 55 60

Leu Phe Glu Leu Val His Arg Gly Arg Gln Ile Ser Glu Ala Leu Thr

65 70 75 80

Ala Arg Arg Gly His Arg Arg Leu Arg Arg Ser Lys Leu Arg Tyr Arg

85 90 95

Pro Pro Arg Phe Asn Asn Arg Gly Asn Lys Gln Arg Gly Trp Leu Ala

100 105 110

Pro Ser Leu Gln His Arg Val Asp Thr Ser Met Ala Trp Val Ser Arg
115 120 125
Ile Gln Arg Leu Thr Pro Val Ser Ala Ile Ser Thr Glu Leu Val Arg

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

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

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

325 330 335
Arg Gly Tyr Leu Thr Arg Ser Lys Ile Ile Lys Gly Phe Gln Thr Gly
340 345 350
Asp Met Val Lys Ala Glu Val Thr Thr Gly Lys Lys Ile Gly Ser Tyr

355 360 365

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

370 375 380

Ser Thr Gly Leu Val Gln Gly Val Ser His Arg Tyr Cys Thr Val Val

385 390 395 400

Gln Arg Gly Asn Gly Tyr Gly Tyr Ser Leu Val Ala Lys Thr Asp Val

405 410 415

Arg Gly Thr Pro Pro Gln His Arg Asp Thr Ser His Pro Ala Leu Tyr

420 425 430

Leu Pro Gly Leu Lys Ala Glu Val Ser Arg Ala Asn

435 440

<210> 257

<211> 334

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-209 effector

<400> 257

Leu Arg Arg Ser Lys Leu Arg Tyr Arg Pro Pro Arg Phe Asp Asn Arg

1 5 10 15

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

20 25 30

Asp Thr Ser Met Ala Trp Val Ser Arg Ile Gln Arg Leu Ala Pro Val

35 40 45

Ser Ala Ile Ser Ile Glu Leu Val Arg Phe Asp Met Gln Ala Met Glu

50 55 60

Asn Pro Glu Ile Glu Gly Ile Gln Tyr Gln Gln Gly Thr Leu Ala Gly

65 70 75 80

Tyr Glu Val Arg Glu Tyr Leu Phe Glu Lys Trp Lys Arg Thr Cys Ala

85 90 95

Tyr Cys Gly Ala Lys Asp Val Pro Leu Gln Val Glu His Ile Gln Pro
100 105 110

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

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

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

Val Ser His Arg Tyr Cys Thr Val Val Gln Arg Gly Asn Gly Tyr Gly
305 310 315 320
Tyr Ser Leu Val Ala Lys Thr Asp Val Arg Gly Thr Pro Pro
325 330

<210> 258

<211> 335

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-210 effector

<400> 258

Leu Arg Tyr Arg Pro Ala His Phe Asp Asn Arg Thr Arg Lys Ala Gly

1 5 10 15

Trp Leu Pro Pro Ser Val Gln His Arg Leu Asp Thr Thr Phe Ala Leu

20 25 30

Val Gln Lys Leu Lys Arg Arg Cys Pro Ile Ser Ala Ile Val Phe Glu

35 40 45

Gln Val Lys Phe Asp Met Gln Lys Met Gln Asn Pro Asn Ile Gln Gly

50 55 60

Val Glu Tyr Gln His Gly Thr Leu Phe Gln Tyr Glu Val Arg Glu Tyr

65 70 75 80

Leu Leu Glu Lys His Arg His Thr Cys Ala Tyr Cys Gly Gly Glu Ser

85 90 95

Gln Asp Thr Ile Leu Glu Val Glu His Lys His Pro Arg Ala Gln Gly

100 105 110

Val Ser Asn Ser Ile Arg Asn Leu Val Met Ala Cys His Thr Cys Asn

115 120 125

Gln Thr Lys Gly Asn Arg Thr Leu Ser Glu Phe Leu Thr Val Leu Lys

130 135 140

Asn Thr Lys Leu Asp Lys Val Arg Lys Val Asn Ile Thr Gln Ile Leu

145 150 155 160

Ala Gly Lys Val Phe Arg Leu Lys Asp Ala Thr Ala Val Asn Ala Cys

165 170 175

Arg His Gln Leu Gly Lys Thr Leu Leu Thr Leu Ser Leu Pro Val Ser

180 185 190

Thr Gly Thr Gly Ala Gln Thr Lys Tyr Asn Arg Met His Tyr Gln Leu

195 200 205

Pro Lys Ser His Ala Leu Asp Ala Leu Met Thr Gly Asn Met Glu Lys

210 215 220

Pro Ile Glu Ala Trp Asn Lys Pro Thr Leu Ile Val Lys Ala Met Gly

225 230 235 240

Arg Gly Cys Tyr Gln Arg Thr Arg Leu Asn Gln Tyr Gly Phe Pro Arg

245 250 255

Gly Tyr Leu Gln Arg Lys Lys Thr Tyr Phe Gly Phe Gln Thr Gly Asp

260 265 270

Leu Val Val Ser Thr Val Leu Lys Gly Lys Lys Ile Gly Thr Tyr Ile

275 280 285

Gly Arg Leu Ala Val Arg Asp Ser Gly Tyr Phe Asn Ile Gln Thr Pro

290 295 300

Ala Gly Val Ile Gln Gly Ile Ser His Lys Thr Cys Arg Leu Ile Gln

305 310 315 320

Arg Asn Thr Gly Tyr His Tyr Tyr Phe Asn Gln Lys Ile Ala Asn

325 330 335

<210> 259

<211> 365

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-211 effector

<400> 259

Leu Thr Phe Pro Met Gly Asp Ser Pro Pro Leu Lys Ala Val Tyr Gly

1 5 10 15

Thr Arg Pro Val Arg Ala Glu Gly Phe Glu Met Gly Val Phe Val Leu

20 25 30

Asp Lys Arg Gly Lys Pro Leu Met Gln Cys Ser Glu Lys Arg Ala Arg
35 40 45
Leu Leu Leu Asp Arg Gly Arg Ala Arg Ile His Lys Met Leu Pro Phe
50 55 60
Thr Ile Arg Val Val Asp Arg Leu Val Glu Asp Ser Gln Leu Gln Pro
65 70 75 80
Leu Glu Ile Lys Leu Asp Pro Gly Ser Lys Thr Thr Gly Val Ala Val
85 90 95

Val Arg Ile Ser Val Ala Val Asp Ala Gln Thr Gly Glu Val Gln Lys
100 105 110
His Val His Val Leu Asn Leu Phe Glu Leu Ile His Arg Ser Arg Gln
115 120 125
Ile Thr Glu Ala Leu Ile Gly Arg Arg Gly His Arg Arg Leu Arg Arg
130 135 140
Ser Lys Leu Arg Tyr Arg Ala Pro Arg Phe Asp Asn Arg Gly Asn Gln
145 150 155 160

Lys Lys Gly Trp Leu Ala Pro Ser Leu Gln His Arg Val Asp Thr Ser
165 170 175
Met Ala Trp Val Ser Arg Ile Gln Arg Leu Ala Pro Val Ser Ala Ile
180 185 190
Ser Thr Glu Leu Val Arg Phe Asp Met Gln Ala Met Glu Asn Pro Glu
195 200 205
Ile Glu Gly Met Gln Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val
210 215 220

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

275 280 285

Pro Glu Arg Leu Lys Arg Ile Gln Val Gln Ala Lys Arg Pro Leu Lys
290 295 300
Asp Ala Ala Ala Val Asn Ser Thr Arg Trp Ala Leu Val Asn Ala Leu
305 310 315 320
Lys Ala Thr Gly Leu Pro Val Glu Thr Ala Ser Gly Gly Gln Thr Lys
325 330 335
Phe Asn Arg Asn Lys Leu Gly Ile Pro Lys Thr His Ala Leu Asp Ala
340 345 350

Val Cys Val Gly Glu Val Gly Ser Ile Thr Asp Trp Gln
355 360 365

<210> 260
<211> 87
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-212 effector
<400> 260
Met Ala Cys Thr Pro Cys Asn Ile Asp Pro Gly Asn Arg Asp Ile Lys
1 5 10 15
Glu Phe Leu Lys Arg Lys Pro Lys Arg Leu Lys Lys Ile Gln Thr Gln

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

85

<210> 261

<211> 88

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-213 effector

<400> 261

Met Ala Cys Thr Pro Cys Asn Ile Asp Pro Gly Asn Arg Asp Ile Lys

1 5 10 15

Glu Phe Leu Lys Arg Lys Pro Lys Arg Leu Lys Lys Ile Gln Thr Gln

20 25 30

Ser Lys Ala Pro Leu Lys Asp Ala Ala Ala Val Asn Ala Thr Arg Tyr

35 40 45

Ala Thr Gly Asn Ala Leu Lys Ser Phe Gly Leu Pro Ile Ala Phe Ser

50 55 60

Ser Gly Gly Arg Thr Lys Phe Asn Arg Ile Lys Leu Gly Tyr Ser Lys

65 70 75 80

Asp His Trp Ile Asp Ala Ala Trp

85

<210> 262

<211> 423

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-214 effector

<400> 262

Met Ala His Asn Lys Gln Pro Leu Met Pro Cys His Pro Ala Arg Ala

1 5 10 15

Arg Lys Leu Leu Lys Lys Gly Lys Ala Ala Val Tyr Arg Arg Tyr Pro

20 25 30

Phe Thr Ile Ile Met Thr His Arg Leu Cys Gly Asp Leu Gln Pro Ile

35 40 45

Glu Ile Lys Phe Asp Pro Gly Ser Arg Thr Thr Gly Ile Ala Leu Val

50 55 60

Gly His Phe Asp Arg Gly Ser Glu Val Ile Trp Ala Gly Asn Leu Asn

65 70 75 80

His Arg Gly Leu Gln Val Lys Ser Asn Leu Val Ser Arg Arg Ala Ile

85 90 95

Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg Pro Ala Arg Phe

100 105 110

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

115 120 125

Arg Val Leu Asn Val Lys Asn Trp Met Leu Lys Leu Ser Arg Leu Ala

130 135 140

Pro Leu Thr Gln Ile Ala Ile Glu Thr Val Arg Phe Asp Thr Gln Lys

145 150 155 160

Met Gln Lys Pro Glu Ile Ser Gly Ile Glu Tyr Gln Gln Gly Glu Leu

165 170 175

Val Gly Tyr Glu Leu Arg Glu Tyr Leu Leu Glu Lys Trp Asp Arg Gln

180 185 190

Cys Ala Tyr Cys Gly Ala Lys Asn Val Pro Leu Glu Ile Glu His Ile

195 200 205

Gln Ala Ser Ser Lys Gly Gly Ser Asn Arg Val Ser Asn Leu Thr Leu

210 215 220

Ala Cys Ser Pro Cys Asn Phe Asp Lys Gly Asn Lys Asp Ile Lys Glu

225 230 235 240

Phe Leu Lys Arg Lys Pro Lys Arg Leu Lys Lys Ile Gln Ala Gln Ala

245 250 255

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

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

370 375 380
Val Val Val Arg Ala Lys Gly Ser Phe Asp Ile Gly Ser Gly Glu Glu
385 390 395 400
Lys Val Gly Gly Ile Ser Tyr Lys Tyr Cys Gln Leu Leu Gln Arg Ser
405 410 415
Asp Gly Tyr Glu Tyr Leu Lys
420

<210> 263

<211> 185

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<

220><223> Category: MG35 effectors

<220><223> Description: MG35-215 effector

<400> 263

Met Ala Lys Asp Pro Lys Arg Val Ala Thr Ile Arg Ala Gln Ala Lys

1 5 10 15

Arg Pro Leu Arg Asp Ala Ala Ala Val Asn Ala Thr Arg Trp Lys Leu

20 25 30

Leu Asn Ala Leu Lys Ala Thr Gly Leu Pro Val Arg Thr Gly Ser Gly

35 40 45

Gly Leu Thr Lys Cys Asn Arg Ser Arg Leu Ala Ile Pro Lys Thr His

50 55 60

Ala Leu Asp Ala Val Cys Ile Gly Glu Val Asp Gln Val Glu Gln Trp

65 70 75 80

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

85 90 95

Arg Thr Arg Leu Asn Arg Phe Gly Phe Pro Arg Gly Tyr Leu Thr Arg

100 105 110

Gln Lys Arg Ile His Gly Phe Gln Thr Gly Asp Arg Val Lys Ala Met

115 120 125

Val Thr Lys Gly Lys Lys Leu Gly Ala Tyr Met Gly Arg Val Ala Val

130 135 140

Arg Ala Ser Gly Ser Phe Asn Ile Gln Ser Ala Glu Gly Leu Val Gln

145 150 155 160

Gly Ile Ser His Arg Tyr Cys Thr Leu Ile Gln Arg Ser Asp Gly Tyr

165 170 175

Gly Tyr Ser Leu Arg Ser Glu Ser Asn

180 185

<210> 264

<211> 185

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-216 effector

<400> 264

Met Ala Lys Lys Pro Glu Leu Leu Lys Arg Ile Leu Ala Gln Ala Lys
1 5 10 15
Arg Pro Leu Lys Asp Ala Ala Ala Val Asn Ser Thr Arg Trp Ala Leu
20 25 30
Val Asn Thr Leu Lys Thr Thr Gly Leu Val Val Glu Thr Gly Thr Gly

35 40 45
Gly Gln Thr Lys Phe Asn Arg Ser Gln Phe Asp Ile Pro Lys Thr His
50 55 60
Ala Leu Asp Ala Ala Cys Val Gly Glu Val Gly Ser Ile Thr Asp Trp
65 70 75 80
Gln Lys Pro Thr Leu Ala Ile Lys Ala Met Gly Arg Gly Ser Tyr Gln
85 90 95
Arg Thr Arg Leu Asp Lys Phe Gly Cys Val Arg Gly Tyr Leu Thr Arg

100 105 110
Ser Lys Ser Ile Lys Gly Phe Gln Thr Gly Asp Met Val Lys Ala Ile
115 120 125
Val Leu Lys Gly Lys Lys Ile Gly Ser Tyr Thr Gly Arg Val Ala Val
130 135 140
Arg Ala Thr Gly Ser Phe Asn Ile Gln Thr Ser Thr Gly Leu Val Gln
145 150 155 160
Gly Val Ser His Arg Tyr Cys Thr Val Val Gln Arg Gly Asn Gly Tyr

165 170 175
Gly Tyr Ser Leu Val Ala Lys Arg Thr
180 185

<210> 265
<211> 315
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-217 effector

<400> 265

Met Ala Met Val Tyr Val Gln Asn Lys Asp Gly Lys Pro Leu Met Pro
1 5 10 15
Thr Thr Arg Tyr Cys Tyr Val Arg Leu Leu Leu Lys Glu Lys Lys Ala

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

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

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

210 215 220
Ala Val Tyr Ala Gln Gln Asp Gly His Cys Leu Phe Cys Lys Lys Pro
225 230 235 240

Ile Asp His Tyr His His Val Val Thr Arg His Lys Gly Gly Ser Glu
245 250 255
Thr Leu Ala Asn Arg Cys Gly Leu Cys Ala Lys His His Asp Leu Val
260 265 270
His Lys Asp Lys Ala Trp Thr Glu Lys Leu Val Thr Arg Lys Gly Gly

275 280 285
Met Asn Lys Lys Tyr His Pro Leu Ser Leu Leu Asn Gln Ile Ile Pro
290 295 300
His Leu Val Glu His Ile Gly Ser Asp Pro Pro
305 310 315
<210> 266
<211> 494
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-218 effector
<400> 266
Met Ala Met Val Tyr Val Gln Asn Lys Asp Gly Lys Pro Leu Met Pro

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

65 70 75 80
Ala His Leu Glu Thr Arg Asn Lys Asp Val Pro Leu Leu Met Gln Lys
85 90 95
Arg Ala Asp Phe Arg Arg Gln His Arg Thr Leu Asp Arg Arg Arg Lys

100 105 110

Arg Gln Arg Arg Ala Lys Ala Ala Gly Thr Thr Ile Ala Glu Gly Ser

115 120 125

Val Glu Arg Leu Leu Pro Gly Tyr Glu Lys Pro Val Val Cys His Tyr

130 135 140

Ile Arg Asn Lys Lys Ala Arg Phe Asn Asn Arg Cys Arg Pro Gln Gly

145 150 155 160

Trp Leu Thr Pro Thr Ala Asn His Leu Leu Gln Thr His Ile Asn Leu

165 170 175

Ile Ala Lys Ile Ala Lys Phe Leu Pro Leu Thr Lys Val Val Val Glu

180 185 190

Leu Asn Arg Phe Val Phe Met Ala Met Asp Asn Pro Asn Ile Arg Arg

195 200 205

Trp Glu Tyr Gln Gln Gly Pro Leu Tyr Gly Leu Gly Ser Val Glu Asp

210 215 220

Ala Val Tyr Ala Gln Gln Asp Gly His Cys Leu Phe Cys Glu Thr Pro

225 230 235 240

Ile Glu Arg Tyr His His Val Ile Pro Arg His Lys Gly Gly Ser Glu

245 250 255

Thr Leu Val Asn Arg Cys Gly Leu Cys Ala Lys His His Asp Leu Val

260 265 270

His Lys Asp Lys Ala Trp Ala Asp Lys Leu Val Thr Arg Lys Glu Gly

275 280 285

Met Asn Lys Lys Tyr His Ala Leu Ser Val Leu Asn Gln Ile Thr Pro

290 295 300

His Leu Met Glu Tyr Leu Gly Glu Lys Thr Ser Tyr Asp Val Tyr Ala

305 310 315 320

Thr Asp Gly Arg Ser Thr Lys Gly Phe Arg Ile Ala Lys Asn Val Pro

325 330 335

Lys Glu His Tyr Thr Asp Ala Tyr Cys Ile Ala Cys Ser Ile Leu Asp

340 345 350

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

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

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

<210> 267
<211> 494
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-219 effector

<400> 267
Met Ala Met Val Tyr Val Gln Asn Lys Asp Gly Lys Pro Leu Met Pro
1 5 10 15
Thr Thr Arg Tyr Cys Tyr Val Arg Leu Leu Leu Lys Glu Asn Lys Ala
20 25 30
Arg Val Val Ser Thr Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr

35 40 45

Pro Asp Ile Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr

50 55 60

Asn Ile Gly Val Ala Val Val Lys Glu Asp Gly Gln Cys Val Phe Ser

65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Asp Val Pro Leu Leu Met Gln Lys

85 90 95

Arg Ala Gly Phe Arg Lys Gln His Arg Thr Leu Asp Arg Arg Arg Lys

100 105 110

Arg Gln Arg Arg Ala Lys Val Ala Gly Thr Thr Val Glu Gly Glu Thr

115 120 125

Ile Glu Arg Leu Leu Pro Gly Tyr Glu Lys Pro Val Val Cys His Tyr

130 135 140

Ile Arg Asn Lys Glu Ala Arg Phe Asn Asn Arg Ser Arg Pro Ala Gly

145 150 155 160

Trp Leu Thr Pro Thr Ala Asn His Leu Leu Gln Thr His Ile Asn Leu

165 170 175

Ile Ala Lys Val Ala Lys Phe Leu Pro Ile Thr Lys Val Val Val Glu

180 185 190

Leu Asn Arg Phe Ala Phe Met Ala Met Asp Asn Pro Asn Ile Arg Arg

195 200 205

Trp Glu Tyr Gln Gln Gly Pro Leu Tyr Gly Leu Gly Ser Val Glu Asp

210 215 220

Ala Val Tyr Ala Gln Gln Asp Gly Arg Cys Leu Phe Cys Lys Lys Pro

225 230 235 240

Ile Asp His Tyr His His Val Val Pro Arg His Lys Gly Gly Ser Glu

245 250 255

Thr Leu Ala Asn Arg Cys Gly Leu Cys Arg Glu His His Ala Leu Val

260 265 270

His Thr Asp Lys Val Trp Ala Asp Lys Leu Val Thr Arg Lys Glu Gly

275 280 285

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

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

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

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

<210> 268
<211> 83
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-220 effector

<400> 268

Met Ala Arg Lys Leu Leu Asn Ala Gly Lys Ala Ala Val Phe Arg Arg
1 5 10 15

Phe Pro Phe Thr Ile Ile Leu Lys Lys Glu Val Glu Val Thr Pro Lys
20 25 30

Ser Ile Thr Leu Lys Leu Asp Pro Gly Ser Lys Thr Thr Gly Ile Ala
35 40 45

Leu Lys Gln Gly Asp Lys Ile Ile Phe Gly Ala Glu Leu Thr His Arg

50 55 60

Gly Gln Ala Ile Lys Ala Ser Leu Glu Ser Arg Arg Ser Leu Arg Arg
65 70 75 80

Ser Arg Arg

<210> 269

<211> 402

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-221 effector

<400> 269

Met Ala Arg Lys Leu Leu Thr Ala Gly Lys Ala Ala Ile Phe Arg Arg
1 5 10 15

Phe Pro Cys Thr Ile Ile Leu Lys Lys Ala Val Thr Ala Thr Ile Glu
20 25 30

Ser Ile Thr Leu Lys Leu Asp Pro Gly Ser Lys Thr Thr Gly Ile Ala
35 40 45

Leu Leu Gln Gly Glu Lys Val Ile Phe Gly Ala Glu Leu Thr His Arg
50 55 60

Gly Gln Thr Ile Lys Ala Ser Leu Glu Ser Arg Arg Ser Leu Arg Arg
65 70 75 80

Gly Arg Arg Asn Arg His Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn
85 90 95

Arg Thr Arg Lys Lys Gly Trp Leu Ala Pro Ser Leu Gln His Arg Val
100 105 110

Glu Thr Thr Leu Thr Trp Val Glu Lys Leu Arg Arg Leu Ala Pro Ile
115 120 125

Gly Leu Ile Val Gln Glu Leu Val Arg Phe Asp Leu Gln Gln Leu Glu
130 135 140

Asn Pro Glu Ile Ser Ala Ile Glu Tyr His Gln Gly Glu Leu Gln Gly
145 150 155 160

Tyr Glu Val Arg Gln Tyr Leu Leu Asn Lys Trp Asn Arg Lys Cys Ala
165 170 175

Tyr Cys Asp Ala Glu Asn Val Pro Leu Gln Val Glu His Ile His Pro
180 185 190

Lys Ser Gln Gly Gly Ser Asn Arg Ile Ser Asn Leu Cys Leu Ala Cys
195 200 205

Gln Lys Cys Asn Gln Lys Lys Gly Thr Gln Asn Ile Glu Gln Phe Leu
210 215 220

Ala Lys Lys Pro Asp Ile Leu Ser Arg Ile Leu Thr Gln Ser Lys Arg
225 230 235 240

Pro Leu Lys Asp Ala Ala Ala Val Asn Ser Thr Arg Trp Thr Leu Phe
245 250 255

Gly Arg Leu Lys Glu Thr Gly Leu Pro Val Leu Thr Gly Ser Gly Gly
260 265 270

Leu Thr Lys Phe Asn Arg Ser Arg Leu Gln Leu Pro Lys Thr His Trp
275 280 285

Leu Asp Ala Ala Cys Val Gly Gln Val Glu Ala Leu Glu Leu Leu Thr
290 295 300

Asn Lys Pro Leu Leu Ile Lys Ala Thr Gly His Gly Thr Arg Gln Met

305 310 315 320

Cys Arg Thr Asp Lys Phe Gly Phe Pro Ser Arg Tyr Val Pro Arg Asn

325 330 335

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

340 345 350

Ile Ser Gly Lys Lys Ile Gly Glu Tyr Val Gly Arg Val Ala Val Arg

355 360 365

Thr Thr Gly Ser Phe Asn Ile Ser Ala Ser Glu Leu Val Gln Gly Ile

370 375 380

Ser His Lys Tyr Cys Lys Ile Val His Lys Lys Asp Gly Tyr Ser Tyr

385 390 395 400

Ala Tyr

<210> 270

<211> 402

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-222 effector

<400> 270

Met Ala Arg Lys Leu Leu Thr Ala Gly Lys Ala Ala Ile Phe Arg Arg

1 5 10 15

Phe Pro Cys Thr Ile Ile Leu Lys Lys Ala Val Thr Ala Thr Ile Glu

20 25 30

Ser Ile Thr Leu Lys Leu Asp Pro Gly Ser Lys Thr Thr Gly Ile Ala

35 40 45

Leu Leu Gln Gly Glu Lys Val Ile Phe Gly Ala Glu Leu Thr His Arg

50 55 60

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

65 70 75 80

Gly Arg Arg Asn Arg His Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn
85 90 95
Arg Thr Arg Lys Lys Gly Trp Leu Ala Pro Ser Leu Gln His Arg Val

100 105 110
Glu Thr Thr Leu Thr Trp Val Glu Lys Leu Arg Arg Leu Ala Pro Ile
115 120 125
Gly Leu Ile Val Gln Glu Leu Val Arg Phe Asp Leu Gln Gln Leu Glu
130 135 140
Asn Pro Glu Ile Ser Ala Ile Glu Tyr His Gln Gly Glu Leu Gln Gly
145 150 155 160
Tyr Glu Val Arg Gln Tyr Leu Leu Asn Lys Trp Asn Arg Lys Cys Ala

165 170 175
Tyr Cys Asp Ala Glu Asn Val Pro Leu Gln Val Glu His Ile His Pro
180 185 190
Lys Ser Gln Gly Gly Ser Asn Arg Ile Ser Asn Leu Cys Leu Ala Cys
195 200 205
Gln Lys Cys Asn Gln Lys Lys Gly Thr Gln Asn Ile Glu Gln Phe Leu
210 215 220
Ala Lys Lys Pro Asp Ile Leu Ser Arg Ile Leu Thr Gln Ser Lys Arg

225 230 235 240
Pro Leu Lys Asp Ala Ala Ala Val Asn Ser Thr Arg Trp Thr Leu Phe
245 250 255
Gly Arg Leu Lys Glu Thr Gly Leu Pro Val Leu Thr Gly Ser Gly Gly
260 265 270
Leu Thr Lys Phe Asn Arg Ser Arg Leu Gln Leu Pro Lys Thr His Trp
275 280 285
Leu Asp Ala Ala Cys Val Gly Gln Val Glu Ala Leu Glu Leu Leu Thr

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

325 330 335

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

340 345 350

Ile Ser Gly Lys Lys Ile Gly Glu Tyr Val Gly Arg Val Ala Val Arg

355 360 365

Thr Thr Gly Ser Phe Asn Ile Ser Ala Ser Glu Leu Val Gln Gly Ile

370 375 380

Ser His Lys Tyr Cys Lys Ile Val His Lys Lys Asp Gly Tyr Ser Tyr

385 390 395 400

Ala Tyr

<210> 271

<211> 441

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220

><223> Description: MG35-223 effector

<400> 271

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

1 5 10 15

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

20 25 30

Lys Leu Leu Lys Asn Gly Lys Ala Ala Val Asp Arg Thr Tyr Pro Phe

35 40 45

Thr Ile Ile Leu Lys Tyr Cys Val Lys Glu Gly Leu Gln Pro Ile Glu

50 55 60

Val Lys Phe Asp Pro Gly Ser Arg Thr Thr Gly Leu Ala Leu Val Gly

65 70 75 80

Asn Phe Glu Arg Gly Lys Glu Val Ile Phe Ala Gly Asn Leu Ile His

85 90 95

Arg Gly Gly Gln Ile Lys Ser Asn Leu Asn Ser Arg Arg Ala Ile Arg

100 105 110

Arg Gly Arg Arg Asn Arg Lys Thr Arg Tyr Arg Pro Ala Arg Phe Asn

115 120 125

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

130 135 140

Val Leu Asn Val Glu Asn Trp Met Leu Lys Leu Ala Arg Leu Ala Pro

145 150 155 160

Leu Thr Gln Ile Ala Val Glu Thr Val Arg Phe Asp Thr Gln Lys Leu

165 170 175

Gln Lys Pro Glu Ile Ser Gly Val Glu Tyr Gln Gln Gly Glu Leu Ala

180 185 190

Gly Tyr Glu Leu Arg Glu Tyr Leu Leu Glu Lys Trp Glu Arg Gln Cys

195 200 205

Ala Tyr Cys Gly Ala Lys Asn Val Pro Leu Glu Val Glu His Ile Gln

210 215 220

Ala Arg Ser Lys Gly Gly Thr Asn Arg Val Ser Asn Leu Thr Leu Ala

225 230 235 240

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

245 250 255

Leu Lys Arg Lys Pro Ser Arg Leu Lys Lys Val Leu Ala Gln Ala Lys

260 265 270

Lys Pro Leu Arg Asp Ala Ala Ala Val Asn Ala Thr Arg Tyr Ala Ile

275 280 285

Gly Val Ala Leu Lys Thr Phe Gly Leu Pro Ile Val Phe Ala Thr Gly

290 295 300

Gly Arg Thr Lys Phe Asn Arg Thr Ser Gly His Tyr Pro Lys Asp His

305 310 315 320

Trp Ile Asp Ala Ala Cys Val Gly Glu Ser Gly Ser Asp Val Ile Ile

325 330 335

Pro Lys Ala Val Thr Pro Leu Ile Ile Lys Ala Lys Gly Arg Gly Ser

340 345 350

Arg Gln Lys Cys Arg Val Asn Gln Tyr Gly Phe Pro Arg Thr Ser Ala

355 360 365

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

370 375 380

Ala Ile Val Thr Lys Gly Lys Lys Ile Gly Thr Tyr Lys Gly Arg Val

385 390 395 400

Leu Val Gln Ala Ala Gly Asn Phe Asp Ile Val Thr Lys Lys Gly Arg

405 410 415

Val Ser Gly Ile Ser His Lys Tyr Cys Gln Leu Phe Gln Arg Ile Asp

420 425 430

Gly Tyr Glu Tyr Ser Leu Thr Ser Asn

435 440

<210> 272

<211> 461

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-224 effector

<400> 272

Met Ala Val Cys Val Leu Asp Arg His Ser Lys Ala Leu Met Pro Cys

1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Arg Val

20 25 30

His Arg Leu Met Pro Phe Val Ile Arg Leu Ile Asp Arg Glu Val Glu

35 40 45

Glu Cys Glu Phe Gln Pro Leu Arg Leu Lys Cys Asp Pro Gly Ser Arg

50 55 60

Thr Thr Gly Met Ala Leu Val Arg Ile Gln Glu Asp Gly Gly Thr Val

65 70 75 80

Val Leu His Leu Phe Glu Leu Lys His Arg Gly Arg Ala Ile Ser Glu
85 90 95
Ala Leu Thr Gly Arg Arg Ala Lys Arg Arg Arg Arg Arg Asn Ala Asn

100 105 110
Leu Arg Tyr Arg Ala Pro Arg Phe Leu Asn Arg Arg Arg Pro Pro Gly
115 120 125
Trp Leu Ala Pro Ser Leu Gln His Arg Val Asp Thr Thr Met Val Trp
130 135 140
Val His Arg Leu Gln Gln Trp Val Leu Leu Thr Gly Ile Ser Ile Glu
145 150 155 160
Leu Val Arg Phe Asp Thr Gln Ala Leu Asp Asn Pro Ala Ile Glu Gly

165 170 175
Ala Glu Tyr Gln Gln Gly Thr Leu Gln Gly Tyr Glu Val Arg Glu Tyr
180 185 190
Leu Leu Glu Lys Trp Gly Arg Lys Cys Ala Tyr Cys Asp Gly Ala Gly
195 200 205
Met Pro Leu Gln Ile Glu His Ile His Pro Lys Ser Gln Gly Gly Ser
210 215 220
His Arg Ile Ser Asn Leu Thr Leu Ala Cys Ala Gly Cys Asn Leu Asn

225 230 235 240
Lys Gly Pro Gln Asp Ile Arg Leu Phe Leu Ala Pro His Pro Gln Arg
245 250 255
Leu Ala Arg Ile Leu Ala Gln Ala Lys Ala Pro Leu Gln Asp Ala Ala
260 265 270
Ala Val Asn Ser Thr Arg Trp Ala Leu Phe Lys Ala Leu Lys Gly Thr
275 280 285
Gly Leu Pro Val Glu Thr Ala Ser Gly Gly Arg Thr Lys Trp Asn Arg

290 295 300
Ser Arg Phe Gly Ile Pro Lys Thr His Ala Leu Asp Ala Val Cys Val
305 310 315 320
Gly Ser Val Ala Lys Val Ser Leu Trp Gln Arg Pro Thr Leu Ala Ile

325 330 335

Lys Ala Thr Gly Arg Gly Ala Tyr Gln Arg Thr Arg Leu Ser Gly His

340 345 350

Gly Phe Pro Arg Gly Tyr Leu Met Gly Gln Lys Gln Val Gln Gly Phe

355 360 365

Gln Thr Gly Asp Arg Val Arg Ala Ile Val Leu Lys Gly Gln Arg Ala

370 375 380

Gly Thr Tyr Leu Gly Arg Val Ala Val Arg Arg Ser Gly Ser Phe Asn

385 390 395 400

Ile Gln Thr Asp Ser Gly Val Val Gln Gly Ile Ser Tyr Lys Tyr Cys

405 410 415

Gln Leu Leu Gln Arg Asn Asp Gly Tyr Gly Tyr Gly Gln His His Asp

420 425 430

Phe Lys Lys Gly Glu Ala Gly Arg Gly Gln Ala Ala Pro Asp Ala Leu

435 440 445

Ser Leu Pro Gly Met Asn Ala Glu Val Ser Arg Ala Ile

450 455 460

<210> 273

<211> 370

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-225 effector

<400

> 273

Met Ala Val Phe Val Phe Asp Lys Arg Gly Lys Pro Leu Met Gln Cys

1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Gly Arg Gly Arg Ala Arg Ile

20 25 30

His Lys Met Leu Pro Phe Thr Ile Arg Val Val Asp Arg Leu Val Glu

35 40 45

Asp Ser Gln Leu Gln Pro Leu Glu Ile Lys Leu Asp Pro Gly Ser Lys
50 55 60

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

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

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

Ser Phe Leu Ser Lys Gln Pro Glu Arg Leu Lys Arg Ile Gln Val Gln
260 265 270
Ala Lys Arg Pro Leu Lys Asp Ala Ala Ala Val Asn Ser Thr Arg Trp
275 280 285
Ala Leu Val Asn Ala Leu Lys Ala Thr Gly Leu Pro Val Glu Thr Ala

290 295 300

Ser Gly Gly Gln Thr Lys Phe Asn Arg Ser Gln Phe Asp Ile Pro Lys
305 310 315 320

Thr His Ala Leu Asp Ala Ala Cys Val Gly Glu Val Gly Ser Ile Thr
325 330 335

Asp Trp Gln Lys Pro Thr Leu Ala Ile Lys Ala Met Gly Arg Gly Ser
340 345 350

Tyr Gln Arg Thr Arg Leu Asp Lys Phe Gly Cys Val Arg Gly Tyr Leu
355 360 365

Thr Arg
370

<210> 274
<211> 391
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors
<220><223> Description: MG35-226 effector
<400> 274

Met Ala Val Phe Val Ile Asp Arg Arg Gln Ala Pro Leu Met Pro Cys
1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Ala Arg Gly Arg Ala Arg Val
20 25 30

His Arg Leu Ile Pro Phe Thr Ile Arg Leu Ile Asp Arg Glu Val Ala
35 40 45

Gln Ser Glu Leu Gln Pro Leu Glu Leu Lys Ile Asp Pro Gly Ser Lys

50 55 60

Thr Ser Gly Leu Ala Leu Val Arg Asn Arg Asn Thr Val Asn Ala Glu
65 70 75 80

Thr Gly Glu Ile Thr Ala Thr Ala His Val Leu Asn Leu Phe Glu Leu
85 90 95

Ile His Arg Gly Val Gln Ile Ser His Ala Leu Thr Ala Arg Arg Gln
100 105 110
Met Arg Arg Arg Arg Arg Ser Ala Asn Leu Arg Tyr Arg Ala Pro Arg

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

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

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

305 310 315 320
Lys Thr His Ala Leu Asp Ala Ala Cys Val Gly Glu Val Asp Phe Val
325 330 335
Glu Gln Trp Gln Lys Pro Thr Leu Glu Ile Lys Ala Thr Gly Arg Gly

340 345 350

Ser Tyr Gln Arg Thr Arg Leu Thr Arg Phe Gly Phe Pro Arg Gly Tyr

355 360 365

Leu Thr Arg Gln Lys Arg Ile His Gly Phe Gln Thr Gly Asp Met Val

370 375 380

Lys Ala Ile Val Thr Lys Gly

385 390

<210> 275

<211> 251

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-227 effector

<400> 275

Met Ala Val Phe Val Leu Asp Lys Arg Gly Lys Pro Leu Met Pro Cys

1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Asp Arg Gly Arg Ala Arg Ile

20 25 30

His Lys Met Leu Pro Phe Thr Ile Arg Val Val Asp Arg Leu Val Glu

35 40 45

Asp Ser Gln Leu Gln Pro Leu Glu Ile Lys Leu Asp Pro Gly Ser Lys

50 55 60

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

65 70 75 80

Thr Gly Glu Val Gln Lys Arg Val His Val Leu Asn Leu Phe Asp Leu

85 90 95

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

100 105 110

His Arg Arg Leu Arg Arg Ser Lys Leu Arg Tyr Arg Ala Pro Arg Phe

115 120 125

Asp Asn Arg Gly Asn Gln Lys Lys Gly Trp Leu Pro Pro Ser Leu Gln

130 135 140

His Arg Val Asp Thr Ser Met Ala Trp Val Ser Arg Ile Gln Arg Leu

145 150 155 160

Ala Pro Val Ser Ala Ile Ser Thr Glu Leu Val Arg Phe Asp Met Gln

165 170 175

Ala Met Glu Asn Pro Glu Ile Glu Gly Met Gln Tyr Gln Gln Gly Thr

180 185 190

Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys Trp Asp Arg

195 200 205

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

210 215 220

Ile Gln Pro Lys Ala Lys Gly Gly Ser Asn Arg Ile Ser Asn Leu Ala

225 230 235 240

Leu Ala Cys Gln Cys Cys Asn Gln Lys Lys Ala

245 250

<210> 276

<211> 472

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-228 effector

<400> 276

Met Ala Val Phe Val Leu Asp Lys Arg Gly Lys Pro Met Met Gln Cys

1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Asp Arg Gly Arg Ala Arg Ile

20 25 30

His Lys Met Leu Pro Phe Thr Ile Arg Val Val Asp Arg Leu Val Glu

35 40 45

Asp Ser Gln Leu Gln Pro Leu Glu Ile Lys Leu Asp Pro Gly Ser Lys

50 55 60

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

65 70 75 80

Thr Gly Glu Val Gln Lys His Val His Val Leu Asn Leu Phe Asp Leu

85 90 95

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

100 105 110

His Arg Arg Leu Arg Arg Ser Lys Leu Arg Tyr Arg Ala Pro Arg Phe

115 120 125

Asn Asn Arg Gly Asn Gln Lys Lys Gly Trp Leu Pro Pro Ser Leu Gln

130 135 140

His Leu Val Asn Thr Ser Leu Glu Trp Val Lys Arg Ile Glu Lys Leu

145 150 155 160

Ala Pro Ile Ser Gly Ile Ser Thr Glu Leu Val Arg Phe Asp Met Gln

165 170 175

Ala Met Glu Asn Pro Lys Ile Glu Gly Met Gln Tyr Gln Gln Gly Thr

180 185 190

Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys Trp Lys Arg

195 200 205

Thr Cys Ala Tyr Cys Asp Ala Lys Asp Val Pro Leu Gln Val Glu His

210 215 220

Ile Gln Pro Lys Ala Lys Gly Gly Ser Asn Arg Ile Ser Asn Leu Ala

225 230 235 240

Leu Ala Cys Pro Ser Cys Asn Ser Lys Lys Ala Ala Leu Pro Ile Glu

245 250 255

Ser Phe Leu Ser Lys Gln Pro Glu Arg Leu Lys Arg Ile Gln Val Gln

260 265 270

Ala Lys Arg Pro Leu Lys Asp Ala Ala Ala Val Asn Ser Thr Arg Trp

275 280 285

Ala Leu Val Asn Ala Leu Lys Ala Thr Trp Leu Pro Val Glu Thr Ala

290 295 300

Ser Gly Gly Lys Thr Lys Phe Asn Arg Asn Gln Leu Gly Ile Pro Lys
305 310 315 320
Thr His Ala Leu Asp Ala Val Cys Val Gly Asn Ile Ser Thr Val Thr

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

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

450 455 460
Lys Ala Glu Val Ser Arg Ala Asn
465 470
<210> 277
<211> 26
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-229 effector
<400> 277
Met Ala Val Phe Val Leu Asp Lys Arg Lys Arg Pro Leu Met Pro Cys

1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Glu

20 25

<210> 278

<211> 434

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-230 effector

<400> 278

Met Ala Val Phe Val Leu Asp Lys Arg Lys Arg Pro Leu Met Pro Cys

1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Arg Val

20 25 30

His Arg Leu Ile Pro Phe Thr Ile Arg Leu Val Asp Arg Arg Val Glu

35 40 45

Asp Ser Val Leu Gln Pro Val Arg Leu Lys Leu Asp Pro Gly Ser Lys

50 55 60

Thr Thr Gly Met Ala Leu Ala Arg Glu Lys Glu Thr Val Asp Asp Ser

65 70 75 80

Thr Gly Glu Ile Ile Arg Thr Leu Ser Val Leu Met Leu Leu Glu Leu

85 90 95

Thr His Arg Gly His Val Ile Arg Asp Ala Leu Thr Ser Arg Ser Gly

100 105 110

His Arg Arg Phe Arg Arg Ser Lys Leu Arg Tyr Arg Pro Ala Arg Phe

115 120 125

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

130 135 140

Arg Val Asp Thr Val Leu Ser Trp Val Asn Arg Leu Thr Arg Trp Ala

145 150 155 160

Pro Val Thr Ala Leu Ser Gln Glu Leu Val Arg Phe Asp Thr Gln Ala
165 170 175
Met Gln Asn Pro Glu Ile Ser Gly Ile Glu Tyr Gln Gln Gly Glu Leu
180 185 190
Leu Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys Trp Gly Arg Lys
195 200 205
Cys Ala Tyr Cys Gly Ala Glu Asn Thr Pro Leu Glu Ile Asp His Ile
210 215 220

His Pro Arg Ser Lys Gly Gly Ser Asn Arg Val Ser Asn Leu Thr Leu
225 230 235 240
Ala Cys His Ala Cys Asn Lys Arg Lys Gly Ser Met Asp Val Lys Lys
245 250 255
Phe Leu Ala Lys Asn Pro Glu Arg Leu Arg Asn Ile Leu Ala Gln Ala
260 265 270
Lys Ala Pro Leu Arg Asp Ala Ala Ala Val Asn Ser Thr Arg Trp Ala
275 280 285

Leu Phe Gln Arg Leu Lys Ala Thr Gly Leu Pro Val Glu Ile Gly Thr
290 295 300
Gly Gly Arg Thr Lys Trp Asn Arg Arg Arg Leu Asn Val Pro Lys Glu
305 310 315 320
His Cys Leu Asp Ala Val Cys Val Gly His Val Asp Leu Leu Glu Asn
325 330 335
Trp Lys Gln Pro Met Leu Phe Val Lys Ala Thr Gly Arg Gly Ser Tyr
340 345 350

Gln Arg Thr Gln Leu Thr Lys Tyr Gly Phe Pro Arg Gly Tyr Phe Met
355 360 365
Arg Ser Lys Lys Ala Phe Gly Phe Gln Thr Gly Asp Met Val Arg Ala
370 375 380
Val Val Thr Thr Gly Lys Lys Val Gly Thr Tyr Phe Gly Arg Val Thr
385 390 395 400

Val Arg Thr Lys Gly Ser Phe Asp Ile Lys Asn Val Ala Thr Ser Ile
405 410 415

Ser Tyr Arg Phe Cys Val Leu Leu Gln Arg Ala Asp Gly Tyr Ala Tyr
420 425 430

Ile Gln

<210> 279

<211> 465

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-231 effector

<400> 279

Met Ala Val Phe Val Leu Asp Gln Ala Gly His Pro Leu Met Pro Cys
1 5 10 15

Thr Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Arg Val
20 25 30

His Arg Val Val Pro Phe Val Ile Arg Leu Val Asp Arg Arg Ala Asp
35 40 45

Ser Cys Gln Phe Gln Pro Leu Arg Val Thr Ile Asp Pro Gly Ser Gln
50 55 60

Ile Thr Gly Leu Ala Leu Val Arg Glu Thr Ala Asp His Gly Arg Ala
65 70 75 80

Val Leu Asn Leu Phe Glu Leu Val His Arg Gly Arg Gln Ile Ser Glu
85 90 95

Ala Leu Thr Ala Arg Arg Ser Met Arg Arg Arg Arg Arg Gly Asn Leu
100 105 110

Arg Tyr Arg Ala Ser Arg Phe Leu Asn Arg Thr Arg Pro Thr Gly Trp
115 120 125

Leu Ala Pro Ser Leu Gln His Arg Val Asp Thr Pro Leu Ser Trp Val

130 135 140

His Lys Ile Arg Arg Trp Ala Pro Val Ser Gly Leu Ser Ser Glu Arg

145 150 155 160

Val Arg Phe Asp Met Gln Gln Met Glu Asn Pro Glu Ile Ala Gly Val

165 170 175

Glu Tyr Gln Arg Gly Thr Leu Ala Gly Tyr Asp Leu Arg Glu Tyr Leu

180 185 190

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

195 200 205

Pro Leu Asn Leu Asp Pro Ile Gln Ala Gln Ala Arg Asn Gly Ser Asn

210 215 220

Arg Ala Ser Asn Phe Thr Leu Ala Cys Leu Pro Cys Asn Gln Lys Lys

225 230 235 240

Ala Glu Arg Asp Ile Arg Glu Phe Leu Ala His Asn Pro Asn Lys Leu

245 250 255

Ala Leu Ile Leu Ala Gln Ala Lys Arg Pro Leu Lys Asp Ala Ala Ala

260 265 270

Val Asn Ala Thr Arg Trp Ala Leu Val Asn Ala Leu Arg Ser Thr Gly

275 280 285

Leu Ala Val Glu Thr Gly Ser Gly Gly Arg Thr Lys Trp Asn Arg Ser

290 295 300

Thr Leu Gly Ile Pro Lys Thr His Ala Leu Asp Ala Ala Cys Val Gly

305 310 315 320

Val Val Asp Ser Val Ser Gly Trp Gln Arg Pro Thr Leu Thr Ile Lys

325 330 335

Ala Thr Gly Arg Gly Ser Tyr Gln Arg Thr Arg Leu Asp Ala Phe Gly

340 345 350

Phe Pro Arg Gly Asp Leu Met Lys Asn Lys Ser Val Lys Gly Phe Gln

355 360 365

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

370 375 380

Val His Arg Gly Arg Val Ala Leu Arg Lys Thr Gly Arg Phe Asn Ile
385 390 395 400
Gln Thr Ala His Gly Val Ile Gln Gly Ile Ser His Ala His Cys Arg

405 410 415
Leu Ile Gln Arg Asn Asp Gly Tyr Gly Tyr Val Gln His Val Arg Ser
420 425 430
Gly Gly Val Val His Ser Trp Lys Asp Lys Leu Pro Asp Phe Leu Pro
435 440 445
Gln Pro His Arg Ala Ala Ser Pro Val Gly Arg Phe Ala Ser Ser Pro
450 455 460
Val
465

<210> 280
<211> 465
<212> PRT

<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-232 effector
<400> 280
Met Ala Val Phe Val Leu Asp Gln Ala Gly His Pro Leu Met Pro Cys
1 5 10 15
Thr Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Arg Val
20 25 30
His Arg Val Val Pro Phe Val Ile Arg Leu Val Asp Arg Arg Ala Asp
35 40 45

Ser Cys Gln Phe Gln Pro Leu Arg Val Thr Ile Asp Pro Gly Ser Gln
50 55 60
Ile Thr Gly Leu Ala Leu Val Arg Glu Thr Ala Asp His Gly Arg Ala
65 70 75 80
Val Leu Asn Leu Phe Glu Leu Val His Arg Gly Arg Gln Ile Ser Glu

85 90 95

Ala Leu Thr Ala Arg Arg Ser Met Arg Arg Arg Arg Arg Gly Asn Leu

100 105 110

Arg Tyr Arg Ala Ser Arg Phe Leu Asn Arg Thr Arg Pro Thr Gly Trp

115 120 125

Leu Ala Pro Ser Leu Gln His Arg Val Asp Thr Thr Leu Ser Trp Val

130 135 140

His Lys Ile Arg Arg Trp Ala Pro Val Ser Gly Leu Ser Ser Glu Arg

145 150 155 160

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

165 170 175

Glu Tyr Gln Arg Gly Thr Leu Ala Gly Tyr Asp Leu Arg Glu Tyr Leu

180 185 190

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

195 200 205

Pro Leu His Leu Asp Pro Ile Gln Ala Gln Ala Arg Asn Gly Ser Asn

210 215 220

Arg Ala Ser Asn Phe Thr Leu Ala Cys Leu Pro Cys Asn Gln Lys Lys

225 230 235 240

Ala Ala Arg Asp Ile Arg Glu Phe Leu Ala His Asn Pro Asn Lys Leu

245 250 255

Ala Leu Ile Leu Ala Gln Ala Lys Arg Pro Leu Lys Asp Ala Ala Ala

260 265 270

Val Asn Ala Thr Arg Trp Ala Leu Val Asn Ala Leu Arg Ser Thr Gly

275 280 285

Leu Ala Val Glu Thr Gly Ser Gly Gly Arg Thr Lys Trp Asn Arg Ser

290 295 300

Thr Leu Gly Ile Pro Lys Thr His Ala Leu Asp Ala Ala Cys Val Gly

305 310 315 320

Val Val Asp Ser Val Ser Gly Trp Gln Arg Pro Thr Leu Thr Ile Lys

325 330 335

Ala Thr Gly Arg Gly Ser Tyr Gln Arg Thr Arg Leu Asp Ala Phe Gly
340 345 350
Phe Arg Arg Gly Asp Leu Met Lys Asn Lys Ser Val Lys Gly Phe Gln
355 360 365

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

Gly Gly Val Val His Ser Trp Lys Asp Lys Leu Pro Asp Phe Leu Pro
435 440 445
Gln Pro His Arg Ala Ala Ser Pro Val Gly Arg Phe Ala Ser Ser Pro
450 455 460
Val
465
<210> 281
<211> 465
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-233 effector
<400> 281
Met Ala Val Phe Val Leu Asp Gln Ala Gly His Pro Leu Met Pro Cys

1 5 10 15
Thr Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Arg Val
20 25 30
His Arg Val Val Pro Phe Val Ile Arg Leu Val Asp Arg Arg Val Asp

35 40 45

Ser Cys Gln Phe Gln Pro Leu Arg Val Thr Ile Asp Pro Gly Ser Gln

50 55 60

Ile Thr Gly Leu Ala Leu Val Arg Glu Thr Ala Asp His Gly Arg Ala

65 70 75 80

Val Leu Asn Leu Phe Glu Leu Val His Arg Gly Arg Gln Ile Ser Glu

85 90 95

Ala Leu Thr Ala Arg Arg Ser Met Arg Arg Arg Arg Arg Gly Asn Leu

100 105 110

Arg Tyr Arg Ala Ser Arg Leu Leu Asn Arg Thr Arg Pro Thr Gly Trp

115 120 125

Leu Ala Pro Ser Leu Gln His Arg Val Asp Thr Pro Leu Ser Trp Val

130 135 140

His Lys Ile Arg Arg Trp Ala Pro Val Ser Gly Leu Ser Ser Glu Arg

145 150 155 160

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

165 170 175

Glu Tyr Gln Arg Gly Thr Leu Ala Gly Tyr Asp Leu Arg Glu Tyr Leu

180 185 190

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

195 200 205

Pro Leu Asn Leu Asp Pro Ile Gln Ala Gln Ala Arg Asn Gly Ser Asn

210 215 220

Arg Ala Ser Asn Phe Thr Leu Ala Cys Leu Pro Cys Asn Gln Lys Lys

225 230 235 240

Ala Ala Arg Asp Ile Arg Glu Phe Leu Ala His Asn Pro Asn Lys Leu

245 250 255

Ala Leu Ile Leu Ala Gln Ala Lys Arg Pro Leu Lys Asp Ala Ala Ala

260 265 270

Val Asn Ala Thr Arg Trp Ala Leu Val Asn Ala Leu Arg Ser Thr Gly

275 280 285

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

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

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

450 455 460
Val
465

<210> 282
<211> 370
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-234 effector

<400> 282

Met Ala Val Phe Val Leu Asp Gln His Gln Lys Pro Leu Met Pro Cys
1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Ala Arg Gly Arg Ala Arg Val
20 25 30

His Arg Leu Ile Pro Phe Thr Ile Arg Val Val Asp Arg Arg Val Ala
35 40 45

Glu Ser Ala Leu Gln Pro Leu Ala Leu Lys Ile Asp Pro Gly Ser Lys
50 55 60

Thr Ser Gly Leu Ala Leu Val Arg Lys Ser Glu Ser Val Asp Val Thr
65 70 75 80

Thr Gly Glu Val Thr Thr Thr Thr His Val Leu Asn Leu Phe Glu Leu
85 90 95

Ile His Arg Gly Phe Gln Ile Ser Lys Ala Leu Thr Ala Arg Arg Gln
100 105 110

Met Arg Arg Arg Arg Arg Ser Ala Asn Leu Arg Tyr Arg Ala Pro Arg
115 120 125

Phe Leu Asn Arg Lys Asn Lys Gly Lys Gly Trp Leu Ala Pro Ser Leu
130 135 140

Gln His Arg Ile Asp Thr Thr Leu Ser Trp Val Thr Arg Ile Ser Asp
145 150 155 160

Val Ala Pro Val Thr Leu Leu Thr Gln Glu Leu Val Arg Phe Asp Met
165 170 175

Gln Gln Leu Glu Asn Pro Glu Ile Ala Gly Val Glu Tyr Gln Gln Gly
180 185 190

Glu Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys Trp Gln
195 200 205

Arg Gln Cys Ala Tyr Cys Asp Val Ser Glu Val Pro Leu Gln Ile Glu
210 215 220

His Ile His Pro Lys Ala Cys Gly Gly Ser Asn Arg Val Ser Asn Leu
225 230 235 240

Ala Leu Ala Cys Ala Pro Cys Asn Leu Lys Lys Ala Ala Gln Asp Ile
245 250 255
Ala Leu Phe Leu Ala Lys Asp Pro Lys Arg Leu Ala Thr Ile Gln Ala
260 265 270
Gln Ala Lys Arg Pro Leu Arg Asp Ala Ala Ala Val Asn Ala Thr Arg
275 280 285

Trp Lys Leu Leu Asn Ala Leu Lys Ala Thr Gly Leu Thr Asn Arg Thr
290 295 300
Gly Ser Gly Gly Leu Thr Lys Phe Asn Arg Ser Arg Leu Val Ile Pro
305 310 315 320
Lys Thr His Ala Leu Asp Ala Ala Cys Val Gly Glu Val Asp Ser Val
325 330 335
Glu Gln Trp Gln Lys Pro Thr Leu Val Ile Asn Ala Thr Gly Arg Gly
340 345 350

Ser Tyr Gln Arg Thr Arg Leu Thr Arg Phe Gly Phe Pro Arg Gly Tyr
355 360 365
Leu Thr
370

<210> 283
<211> 239
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-235 effector
<400> 283
Met Ala Val Phe Val Leu Asp Arg Gly Gly Arg Pro Leu Met Pro Cys
1 5 10 15
Thr Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Cys Val

20 25 30
His Leu Val Met Pro Phe Thr Ile Arg Ile Val Asp Leu Lys Ala Glu

35 40 45

Asn Cys Ala Phe Gln Ala Leu Arg Val Lys Leu Asp Pro Gly Ser Lys

50 55 60

Ala Thr Gly Ile Ala Leu Val Arg Glu Thr Glu Gly Lys Gly Val Ala

65 70 75 80

Val Val Asn Leu Phe Glu Leu Val His Arg Gly Arg Gln Ile Ser Glu

85 90 95

Ala Leu Thr Ala Arg Arg Gly His Arg Arg Leu Arg Arg Ser Lys Leu

100 105 110

Arg Tyr Arg Pro Pro Arg Phe Asp Asn Arg Gly Asn Lys Gln Arg Gly

115 120 125

Trp Leu Ala Pro Ser Leu Gln His Arg Val Asp Thr Ser Met Ala Trp

130 135 140

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

145 150 155 160

Leu Val Arg Phe Asp Met Gln Ala Leu Glu Asn Pro Glu Ile Glu Gly

165 170 175

Ala Gln Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr

180 185 190

Leu Leu Glu Lys Trp Asp Arg Thr Cys Ala Tyr Cys Gly Ala Lys Asp

195 200 205

Val Pro Leu Gln Val Glu His Ile Gln Pro Lys Ala Lys Gly Gly Ser

210 215 220

Asn Arg Ile Ser Asn Leu Ala Leu Ala Cys Gln Cys Cys Asn Gln

225 230 235

<210> 284

<211> 447

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-236 effector

<400> 284

```
Met Ala Val Phe Val Leu Asp Arg His Lys Lys Pro Leu Met Pro Cys
1               5                  10                  15

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

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

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

Arg Cys Ala Tyr Cys Gly Thr Glu Gly Val Pro Leu Glu Ile Asp His
    210                 215                 220
Ile Val Pro Lys Ser Arg Gly Gly Ser Asp Arg Met Ser Asn Leu Ile
```

225 230 235 240

Leu Ala Cys Arg Asn Cys Asn Gln Ala Lys Gly Asn Leu Asn Val Arg

245 250 255

Ala Phe Met Ala His Asp Gln Lys Arg Leu Ala Arg Ile Leu Ala Gln

260 265 270

Ala Arg Ala Ser Leu Arg Asp Ala Ala Ala Val Asn Ser Thr Cys Trp

275 280 285

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

290 295 300

Thr Gly Glu Arg Thr Lys Trp Asn Arg Thr Arg Leu Gly Leu Pro Lys

305 310 315 320

Thr His Ala Leu Asp Ala Ala Cys Val Gly Gln Val Asp Ala Ile Val

325 330 335

Ala Trp Arg Val Pro Ile Leu Asn Ile Arg Cys Thr Gly Arg Gly Ser

340 345 350

His Gln Arg Thr Arg Leu Asp Arg Tyr Gly Phe Pro Arg Gly Tyr Leu

355 360 365

Met Arg Ser Lys Arg Val Gln Gly Phe Gln Thr Gly Asp Leu Val Lys

370 375 380

Ala Val Val Leu Ser Gly Lys Asn Ala Ala Ile His Val Gly Arg Val

385 390 395 400

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

405 410 415

Ile Gln Gly Val His Ala Arg Arg Cys Ser Ile Val Gln Arg Gly Asp

420 425 430

Gly Tyr Ala Tyr Ser Phe Arg Gln Ile Pro Gln Met Thr Ser Val

435 440 445

<210> 285

<211> 351

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220

><223> Category: MG35 effectors

<220><223> Description: MG35-237 effector

<400> 285

Met Ala Val Phe Val Leu Asp Arg His Gln Lys Pro Leu Met Pro Cys
1 5 10 15

Ser Glu Lys Arg Ala Arg Lys Leu Leu Ala Arg Gly Arg Ala Arg Val
20 25 30

His Arg Leu Met Pro Phe Ser Ile Arg Leu Val Asp Arg Cys Val Asn
35 40 45

Asp Ser Val Leu Gln Pro Leu Lys Ile Lys Leu Asp Pro Gly Ser Lys

50 55 60

Thr Thr Gly Met Ala Leu Val Arg Glu Ser Ala Val Val Asp Glu Glu
65 70 75 80

Thr Gly Glu Leu Lys Ala Met Val His Val Leu Asn Leu Phe Glu Ile
85 90 95

Gln His Arg Gly Gln Gln Ile Ser Glu Thr Leu Thr Ala Arg Arg Gln
100 105 110

Met Arg Arg Arg Arg Arg Gly Asn Leu Arg Tyr Arg Ala Pro Gln Phe

115 120 125

Leu Asn Arg Gly Asn Lys Lys Lys Gly Trp Ile Ala Pro Ser Leu Gln
130 135 140

His Arg Val Asp Thr Thr Leu Ala Trp Val Asn Arg Leu Thr Gly Leu
145 150 155 160

Ala Pro Val Thr Gly Ile Ala Gln Glu Leu Val Arg Phe Asp Leu Gln
165 170 175

Gln Met Glu Asn Pro Glu Ile Ser Gly Ile Glu Tyr Gln Gln Gly Thr

180 185 190

Leu Ala Gly Tyr Glu Thr Arg Glu Tyr Leu Leu Asn Gln Trp Gly Arg
195 200 205

Glu Cys Ala Tyr Cys Gly Ala Arg Asn Thr Pro Leu Gln Ile Glu His

210 215 220

Ile His Ser Lys Ala Gln Gly Gly Ser Asp Arg Val Ser Asn Leu Thr

225 230 235 240

Leu Ala Cys Arg Pro Cys Asn Gln Gln Lys Gly Ala Gln Asp Leu Lys

245 250 255

Val Phe Leu Val Lys Asp Pro Lys Arg Leu Ala Arg Ile Gln Ala Gln

260 265 270

Ala Lys Lys Pro Leu Lys Asp Ala Ala Ala Val Asn Ser Thr Arg Trp

275 280 285

Ala Leu Phe Gln Ala Leu His Ala Thr Gly Leu Pro Val Thr Thr Gly

290 295 300

Ser Gly Gly Leu Thr Lys Phe Asn Arg Met Arg Phe Gly Ile Pro Lys

305 310 315 320

Thr His Ala Leu Asp Ala Ala Cys Val Gly Phe Ile Ala Ala Leu Ser

325 330 335

Asp Trp Glu Lys Pro Thr Leu Val Ile Lys Ala Thr Gly Arg Gly

340 345 350

<210> 286

<211> 457

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-238 effector

<400> 286

Met Ala Val Phe Val Leu Asp Arg His Gln Lys Pro Leu Met Pro Cys

1 5 10 15

Ser Glu Lys Arg Ala Arg Lys Leu Leu Ala Arg Gly Arg Ala Arg Val

20 25 30

His Arg Leu Met Pro Phe Ser Ile Arg Leu Val Asp Arg Cys Val Asn

35 40 45

Asp Ser Val Leu Gln Pro Leu Lys Ile Lys Leu Asp Pro Gly Ser Lys
50 55 60

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

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

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

Val Phe Leu Val Lys Asp Pro Lys Arg Leu Ala Arg Ile Gln Ala Gln
260 265 270
Ala Lys Lys Pro Leu Lys Asp Ala Ala Ala Val Asn Ser Thr Arg Trp
275 280 285
Ala Leu Phe Gln Ala Leu His Ala Thr Gly Leu Pro Val Thr Thr Gly

290 295 300

Ser Gly Gly Leu Thr Lys Phe Asn Arg Met Arg Phe Gly Ile Pro Lys
305 310 315 320

Thr His Ala Leu Asp Ala Ala Cys Val Gly Phe Ile Ala Ala Leu Ser
325 330 335

Asp Trp Glu Lys Pro Thr Leu Val Ile Lys Ala Thr Gly Arg Gly Ser
340 345 350

Tyr Gln Arg Thr Arg Leu Asn Ala Phe Gly Phe Pro Arg Gly Tyr Leu
355 360 365

Thr Arg Gln Lys Arg Ile Lys Glu Phe Gln Thr Gly Asp Leu Ile Lys
370 375 380

Ala Asp Val Thr Lys Gly Lys Lys Met Gly Val Tyr Ile Gly Arg Val
385 390 395 400

Ala Val Arg Ala Ser Gly Ser Phe Asn Ile Gln Thr Ala Gln Gly Val
405 410 415

Val Gln Gly Ile Ser Asp Arg Tyr Cys Gln Ile Leu Gln Arg Ala Asp
420 425 430

Gly Tyr Gly Tyr Ser Gln Arg Gly Thr Pro Glu Lys Ala Ala Glu Leu
435 440 445

Cys Ser Ala Arg Tyr Pro Ser Pro Ala
450 455

<210> 287

<211> 52

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-239 effector

<400> 287

Met Ala Val Phe Val Leu Asp Arg His Gln Lys Pro Leu Met Pro Cys
1 5 10 15

Ser Glu Lys Arg Ala Arg Met Leu Leu Asp Arg Gly Arg Ala Arg Val
20 25 30

His Arg Leu Met Pro Phe Ser Ile Arg Leu Val Asp Arg Cys Val Asn
35 40 45
Asp Ser Ala Leu
50

<210> 288
<211> 239
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-240 effector
<400> 288
Met Ala Val Phe Val Leu Asp Arg His Gln Lys Pro Leu Met Pro Cys
1 5 10 15

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

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

130 135 140

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

Glu Cys Ala Tyr Cys Gly Thr Gln Asn Val Pro Leu Gln Ile Glu His
210 215 220
Ile Gln Pro Lys Ala His Gly Gly Ser Arg Arg Ile Ala Asn Leu
225 230 235

<210> 289
<211> 89
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-241 effector
<400> 289
Met Ala Val Phe Val Leu Asp Arg His Gln Lys Pro Leu Met Pro Cys

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

65 70 75 80

Thr Gly Asp Val Thr Thr Thr Ala Gln

85

<210> 290

<211> 47

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-242 effector

<400> 290

Met Ala Val Phe Val Leu Asp Arg Arg Gly Thr Pro Leu Met Pro Cys

1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Asp Arg Gly Arg Ala Arg Ile

20 25 30

His Lys Met Leu Pro Phe Thr Ile Arg Val Val Asp Arg Leu Val

35 40 45

<210> 291

<211> 352

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-243 effector

<400> 291

Met Ala Val Phe Val Leu Asp Arg Arg Gly Thr Pro Leu Met Pro Cys

1 5 10 15

Thr Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Cys Val

20 25 30

His Leu Val Met Pro Phe Thr Ile Arg Ile Val Asp Leu Lys Ala Glu

35 40 45

```
Asn Cys Ala Phe Gln Ala Leu Arg Val Lys Leu Asp Pro Gly Ser Lys
    50                  55                  60
Ala Thr Gly Ile Ala Leu Val Arg Glu Thr Glu Gly Lys Gly Val Ala
65                  70                  75                  80

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

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

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

Ala Val Asn Ser Thr Arg Trp Ala Leu Val Asn Ala Leu Lys Ala Thr
        275                 280                 285
Gly Leu Pro Val Glu Thr Ala Ser Gly Gly Gln Thr Lys Phe Asn Arg
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290 295 300

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

305 310 315 320

Gly Glu Val Gly Ser Ile Thr Asp Trp Gln Lys Pro Thr Leu Ala Ile

325 330 335

Lys Ala Met Gly Arg Gly Ser Tyr Gln Arg Thr Arg Leu Asp Lys Phe

340 345 350

<210> 292

<211> 463

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-244 effector

<400> 292

Met Ala Val Phe Val Leu Asp Arg Arg Gly Thr Pro Leu Met Pro Cys

1 5 10 15

Thr Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Cys Val

20 25 30

His Leu Val Met Pro Phe Thr Ile Arg Ile Val Asp Leu Lys Ala Glu

35 40 45

Asn Cys Ala Phe Gln Ala Leu Arg Val Lys Leu Asp Pro Gly Ser Lys

50 55 60

Ala Thr Gly Ile Ala Leu Val Arg Glu Thr Glu Gly Lys Gly Val Ala

65 70 75 80

Val Val Asn Leu Phe Glu Leu Val His Arg Gly Arg Gln Ile Ser Glu

85 90 95

Ala Leu Thr Ala Arg Arg Gly His Arg Arg Leu Arg Arg Ser Lys Leu

100 105 110

Arg Tyr Arg Pro Pro Arg Phe Asn Asn Arg Gly Asn Lys Gln Arg Gly

115 120 125

```
Trp Leu Ala Pro Ser Leu Gln His Arg Val Asp Thr Ser Met Ala Trp
    130                 135                 140
Val Ser Arg Ile Gln Arg Leu Ala Pro Val Ser Ala Ile Ser Thr Glu

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

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

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

            340                 345                 350
Gly Cys Val Arg Gly Tyr Leu Thr Arg Ser Lys Ser Ile Lys Gly Phe
        355                 360                 365
Gln Thr Gly Asp Met Val Lys Val Glu Val Thr Lys Gly Lys Lys Ile
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370 375 380

Gly Ser Tyr Thr Gly Arg Val Ala Val Arg Ala Thr Gly Ser Phe Asn

385 390 395 400

Ile Gln Thr Ser Thr Gly Leu Val Gln Gly Val Ser His Arg Tyr Cys

405 410 415

Thr Val Val Gln Arg Gly Asn Gly Tyr Gly Tyr Ser Leu Val Ala Lys

420 425 430

Met Asp Val Arg Gly Thr Leu Pro Gln His Arg Asp Ala Ser His Pro

435 440 445

Ala Leu Tyr Leu Pro Gly Leu Lys Ala Glu Val Ser Arg Ala Asn

450 455 460

<210> 293

<211> 47

<212> PRT

<213> Unknown

<220

><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-245 effector

<400> 293

Met Ala Val Phe Val Leu Asp Arg Arg Lys Lys Pro Leu Met Pro Cys

1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Arg Val

20 25 30

His Arg Leu Arg Glu Thr Ser Arg Ile Ser Val Val Gln Leu Leu

35 40 45

<210> 294

<211> 77

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-246 effector

<400> 294

Met Ala Val Phe Val Leu Asp Arg Arg Lys Lys Pro Leu Met Pro Cys
1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Arg Val
20 25 30

His Arg Leu Val Pro Phe Thr Ile Arg Leu Ile Asp Arg Glu Gln Glu

35 40 45

Asp Cys Ala Leu Gln Pro Val Arg Leu Lys Leu Asp Pro Gly Ser Lys
50 55 60

Thr Thr Gly Met Ala Leu Val Arg Glu Ser Gln Gln Val
65 70 75

<210> 295

<211> 506

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-247 effector

<400
> 295

Met Ala Val Phe Val Leu Asp Arg Arg Lys Lys Pro Leu Met Pro Cys
1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Arg Val
20 25 30

His Arg Leu Val Pro Phe Thr Ile Arg Leu Val Asp Arg Arg Val Glu
35 40 45

Asp Ser Ser Leu Gln Gln Leu Arg Val Lys Leu Asp Pro Gly Ser Lys
50 55 60

Thr Thr Gly Ile Ala Leu Val Arg Asp Ser Lys Asp Val Asp Ala Gln
65 70 75 80

Thr Gly Gln Ala Arg Lys Thr Ala His Val Leu Phe Leu Ala Glu Leu
85 90 95
His His Arg Gly His Ala Ile Arg Asp Ala Leu Arg Gln Arg Ala Ala
100 105 110
Phe Arg Arg Arg Arg Arg Cys Ala Asn Leu Arg His Arg Gln Pro Arg
115 120 125

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

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

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

Thr His Ala Leu Asp Ala Val Cys Val Gly Asp Val Ala Ala Val Arg

325 330 335

Gly Trp Ser Val Pro Thr Leu Gly Ile Gln Cys Ala Gly Arg Gly Ser

340 345 350

Tyr Gln Arg Thr Arg Leu Asn Arg His Gly Phe Pro Arg Gly Tyr Leu

355 360 365

Thr Arg Ser Lys Arg His Phe Gly Phe Gln Thr Gly Asp Met Val Arg

370 375 380

Ala Val Val Thr Thr Arg Arg Lys Val Val Thr Tyr Val Gly Arg Val

385 390 395 400

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

405 410 415

Val Gln Gly Ile His His Arg Phe Cys Ala Leu Met Gln Arg Ala Asp

420 425 430

Gly Tyr Gly Tyr Ala Trp Arg Arg Thr Ala Phe Val Lys Glu Glu Ala

435 440 445

Gly Thr Gly Ile Ala Cys Ala Thr Ala Leu Tyr Pro Leu Arg Pro Glu

450 455 460

Gly Arg Ser Leu Pro Arg Asn Leu Asp Glu Ile Arg Ser Gly Thr Asp

465 470 475 480

Leu Thr Gly Tyr Ala Gly Arg Ala Ile Arg Thr Ala Leu Ala Ala Ile

485 490 495

Gly Ser Asp Leu Ser Val Gln Pro Thr Asp

500 505

<210> 296

<211> 370

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-248 effector

<400> 296

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

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

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

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

Ala Leu Ala Cys Ala Pro Cys Asn Leu Arg Lys Ala Ala Gln Asp Val

245 250 255

Thr Gln Phe Leu Glu Lys Asp Pro Lys Arg Leu Ala Thr Ile Gln Ala

260 265 270

Gln Ala Lys Arg Pro Leu Arg Asp Ala Ala Ala Val Asn Ala Thr Arg

275 280 285

Trp Lys Leu Leu Asn Ala Leu Lys Ala Thr Gly Leu Thr Asn Arg Thr

290 295 300

Gly Ser Gly Gly Leu Thr Lys Phe Asn Arg Ser Arg Leu Val Ile Pro

305 310 315 320

Lys Thr His Ala Leu Asp Ala Val Cys Val Gly Glu Gly Asp Phe Val

325 330 335

Glu Gln Trp Gln Lys Pro Thr Leu Val Ile Lys Ala Thr Gly Arg Gly

340 345 350

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

355 360 365

Leu Thr

370

<210> 297

<211> 222

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-249 effector

<400> 297

Met Ala Val Phe Val Leu Asp Arg Ser Ala Arg Pro Leu Met Pro Cys

1 5 10 15

Thr Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Arg Val

20 25 30

His Lys Val Met Pro Phe Thr Ile Arg Val Val Asp Leu Glu Ala Glu

35 40 45

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

100 105 110
Leu Arg Tyr Arg Ala Pro Arg Phe Leu Asn Arg Gly Asn Lys Lys Ser
115 120 125
Gly Trp Leu Ala Pro Ser Leu Gln His Arg Val Asp Thr Thr Leu Ala
130 135 140
Trp Val Asn Arg Leu Glu Arg Leu Ala Pro Val Ser Ala Ile Ser Thr
145 150 155 160
Glu Leu Val Arg Phe Asp Met Gln Ala Leu Glu Asn Pro Asp Ile Glu

165 170 175
Gly Ala Gln Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val His Glu
180 185 190
Tyr Leu Leu Glu Asn Trp Gly Arg Thr Cys Ala Ser Cys Gly Ala Arg
195 200 205
His Val Pro Leu His Asn Glu His Leu His Arg Asn Ser Lys
210 215 220

<210> 298
<211> 480
<212> PRT
<213> Unknown
<220><223> Description of Unknown:

uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-250 effector
<400> 298
Met Ala Val Phe Val Leu Asp Arg Ser Gly Lys Pro Leu Met Pro Cys

1 5 10 15

Ser Glu Lys Arg Ala Arg Lys Leu Leu Ala Ala Gly Arg Ala Arg Val

20 25 30

His Arg Val Met Pro Phe Val Ile Arg Ile Val Asp Arg Arg Leu Gln

35 40 45

Asp Ser Ala Leu Gln Pro Leu Arg Val Lys Ile Asp Pro Gly Ser Lys

50 55 60

Thr Thr Gly Leu Ala Leu Val Arg Glu Ala Glu Ser Ile Asp Ala Ala

65 70 75 80

Ser Gly Glu Val Arg Arg Glu Leu Phe Val Leu Asn Leu Phe Asp Leu

85 90 95

Val His Arg Gly Arg Gln Ile Ser Glu Ala Leu Thr Gly Arg Arg Thr

100 105 110

Phe Arg Arg Arg Arg Arg Gly Ala Asn Leu Arg Tyr Arg Ala Pro Arg

115 120 125

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

130 135 140

His Arg Ile Glu Thr Thr Leu Ala Trp Val Arg Arg Leu Gln Arg Trp

145 150 155 160

Ala Pro Val Thr Ala Leu Ser Gln Glu Leu Val Arg Phe Asp Met Gln

165 170 175

Lys Met Glu Asn Ala Glu Ile Ala Gly Val Glu Tyr Gln Gln Gly Thr

180 185 190

Leu Ala Gly Tyr Glu Leu Arg Glu Tyr Leu Leu Glu Lys Phe Asn Arg

195 200 205

Ser Cys Cys Tyr Cys Asp Ala Lys Asp Val Pro Leu Asn Ile Glu His

210 215 220

Ile His Pro Lys Ala Gln Gly Gly Thr Asn Arg Ala Ser Asn Leu Ala

225 230 235 240

Ile Ala Cys Val Pro Cys Asn Thr Lys Lys Gly Ala Arg Ser Ile Glu

245 250 255

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

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

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

Gly Tyr Ser Tyr Ala Trp Ser Ile Thr Pro Ser Asn Thr Gly Lys Asn
435 440 445
Asn Phe Pro Val Ser Ser Arg Leu Leu Thr Gly Arg Leu Arg Leu Asn
450 455 460
Val Ala Thr Gln Gln Ala Ser Gln Gly Gly Gly Ile His Arg Ser Ile
465 470 475 480
<210> 299
<211> 286
<212> PRT
<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors
<220><223> Description: MG35-251 effector
<400> 299

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

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

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

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

245 250 255
Ala Phe Leu Ala Lys Asp Pro Ala Arg Leu Ala Arg Ile Arg Ala Gln
260 265 270
Leu Lys Arg Pro Leu Lys Asp Ala Ala Ala Val Asn Ala Thr
275 280 285

<210> 300

<211> 475

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-252 effector

<400> 300

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

Thr Thr Gly Ile Ala Leu Val Arg Asp Thr Ala Thr Val Glu Thr Thr
65 70 75 80
Thr Gly Glu Ser Gly Pro Gly Ala Val Val Cys Asn Leu Phe Glu Leu
85 90 95
Met His Arg Gly Ala Ala Ile Arg Lys Ala Leu Arg Gln Arg Ala Ala

100 105 110

Phe Arg Arg Arg Arg Arg Ser Ala Asn Leu Arg Tyr Arg Ala Pro Arg

115 120 125

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

130 135 140

His Arg Val Asp Thr Thr Leu Ala Trp Val Glu Arg Leu Arg Arg Leu

145 150 155 160

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

165 170 175

Gln Val Gln Asn Pro Glu Ile Ser Gly Val Glu Tyr Gln Gln Gly Thr

180 185 190

Leu Arg Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys Phe Glu Arg

195 200 205

Thr Cys Ala Tyr Cys Asp Ala Gln Asn Val Pro Phe Asn Val Asp His

210 215 220

Val Arg Pro Gln Ala Gly Gly Gly Ser Asp Arg Val Ser Asn Leu Ala

225 230 235 240

Leu Ser Cys Val Pro Cys Asn Glu Ala Lys Asp Asp Ser Pro Val Glu

245 250 255

Met Phe Leu Ala His Asp Pro Glu Arg Leu Ala Arg Ile Lys Gln Gln

260 265 270

Leu Lys Thr Pro Leu Arg Asp Ala Ala Val Val Asn Ala Thr Arg Trp

275 280 285

Thr Leu Val Arg Ala Leu Arg Ala Thr Gly Leu Pro Leu Glu Thr Gly

290 295 300

Ser Gly Gly Arg Thr Lys Trp Asn Arg Val Arg Leu Gly Ile Pro Lys

305 310 315 320

Thr His Ala Leu Asp Ala Ala Cys Val Gly Ala Val Glu Gln Val Val

325 330 335

Asp Trp Ser Arg Pro Ala Leu Thr Ile Lys Ala Thr Gly Arg Gly Ala

340 345 350

Tyr Gln Arg Thr Leu Leu Thr Ala His Gly Phe Pro Arg Gly Tyr Leu
355 360 365

Met Arg Gln Lys Arg Ala His Gly Phe Arg Thr Gly Asp Leu Val Ala
370 375 380

Ala Thr Ile Pro Ala Gly Arg His Ala Gly Gln His Arg Gly Arg Val
385 390 395 400

Ala Ile Arg Thr Arg Pro Ser Phe Ala Leu Gln Thr Glu Ser Gly Thr
405 410 415

Phe Asp Val His Ala Arg His Leu Arg Leu Leu Gln Arg Gly Asp Gly
420 425 430

Tyr Gly Tyr Cys Ser Gln Pro Leu Pro Gln Pro Leu Arg Gly Gly Leu
435 440 445

Ser Ser Pro Arg Tyr Asp Gly Gly Ala Val Asp Gln Gln Ala Leu Trp
450 455 460

Ser Glu Arg Trp Val Arg Ala Lys Gln Asp Cys
465 470 475

<210> 301

<211> 293

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-253 effector

<400> 301

Met Ala Val Phe Val Leu Asp Arg Ser Gly Arg Pro Leu Met Pro Cys
1 5 10 15

Thr Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Cys Val
20 25 30

His Leu Val Met Pro Phe Thr Ile Arg Ile Val Asp Leu Lys Ala Glu
35 40 45

Asn Cys Ala Phe Gln Ala Leu Arg Val Lys Leu Asp Pro Gly Ser Lys

50 55 60

Ala Thr Gly Ile Ala Leu Val Arg Glu Thr Glu Cys Lys Gly Val Ala
65 70 75 80

Val Val Asn Leu Phe Glu Leu Val His Arg Gly Arg Gln Ile Ser Glu
85 90 95

Ala Leu Thr Ala Arg Arg Gly His Arg Arg Leu Arg Arg Ser Lys Leu
100 105 110

Arg Tyr Arg Pro Pro Arg Phe Asn Asn Arg Gly Asn Gln Lys Lys Gly
115 120 125

Trp Leu Pro Pro Ser Leu Gln His Arg Val Asp Thr Ser Met Ala Trp
130 135 140

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

Leu Val Arg Phe Asp Met Gln Ala Met Glu Asn Pro Glu Ile Glu Gly
165 170 175

Ala Gln Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr
180 185 190

Leu Leu Glu Lys Trp Gly Arg Thr Cys Ala Tyr Cys Gly Ala Lys Asp
195 200 205

Val Pro Leu Gln Ile Glu His Ile His Pro Lys Ser Lys Asn Gly Ser
210 215 220

Asp Arg Ile Asn Asn Leu Thr Leu Ala Cys Gln Cys Cys Asn Gln Lys
225 230 235 240

Lys Ala Ala Leu Pro Val Glu Met Phe Leu Ala Lys Lys Pro Glu Leu
245 250 255

Leu Lys Arg Ile Leu Ala Gln Ala Lys Arg Pro Leu Lys Asp Ala Ala
260 265 270

Ala Val Asn Ser Thr Arg Trp Ala Leu Val Asn Ala Leu Lys Ala Thr
275 280 285

Arg Leu Pro Val Glu
290

<210> 302

<211> 440

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-254 effector

<400> 302

Met Ala Val Phe Val Leu Asp Arg Ser Gly Arg Pro Leu Met Pro Cys
1 5 10 15

Thr Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Cys Val
20 25 30

His Leu Val Met Pro Phe Thr Ile Arg Ile Val Asp Leu Lys Ala Glu
35 40 45

Asn Cys Ala Phe Gln Ala Leu Arg Val Lys Leu Asp Pro Gly Ser Lys
50 55 60

Ala Thr Gly Ile Ala Leu Val Arg Glu Thr Glu Gly Lys Gly Val Ala
65 70 75 80

Val Val Asn Leu Phe Glu Leu Val His Arg Gly Arg Gln Ile Ser Glu
85 90 95

Ala Leu Thr Ala Arg Arg Gly His Arg Arg Leu Arg Arg Ser Lys Leu
100 105 110

Arg Tyr Arg Pro Pro Arg Phe Asp Asn Arg Gly Asn Lys Gln Arg Gly
115 120 125

Trp Leu Ala Pro Ser Leu Gln His Arg Val Asp Thr Ser Met Ala Trp
130 135 140

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

Leu Val Arg Phe Asp Ala Gln Ala Leu Glu Asn Pro Glu Ile Glu Gly
165 170 175

Ala Gln Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr

180 185 190

Leu Leu Glu Lys Trp Asp Arg Thr Cys Ala Tyr Cys Gly Ala Lys Asp

195 200 205

Val Pro Leu Gln Ile Glu His Ile His Pro Lys Ser Lys Asn Gly Ser

210 215 220

Asp Arg Ile Asn Asn Leu Thr Leu Ala Cys Gln Cys Cys Asn Gln Lys

225 230 235 240

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

245 250 255

Leu Lys Arg Ile Leu Ala Gln Ala Lys Arg Pro Leu Lys Asp Ala Ala

260 265 270

Ala Val Asn Ser Thr Arg Trp Ala Leu Val Asn Thr Leu Lys Thr Thr

275 280 285

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

290 295 300

Ser Gln Phe Asp Ile Pro Lys Thr His Ala Leu Asp Ala Ala Cys Val

305 310 315 320

Gly Glu Val Gly Ser Ile Thr Asp Trp Gln Lys Pro Thr Leu Ala Ile

325 330 335

Lys Ala Met Gly Arg Gly Ser Tyr Gln Arg Thr Arg Leu Asp Lys Phe

340 345 350

Gly Cys Val Arg Gly Tyr Leu Thr Arg Ser Lys Ser Ile Lys Gly Phe

355 360 365

Gln Thr Gly Asp Met Val Lys Ala Glu Val Thr Thr Gly Lys Lys Ile

370 375 380

Gly Ser Tyr Thr Gly Arg Val Ala Val Arg Ala Thr Gly Ser Phe Asn

385 390 395 400

Ile Gln Thr Ser Thr Gly Leu Val Gln Gly Val Ser His Arg Tyr Cys

405 410 415

Thr Val Val Gln Arg Gly Asn Gly Tyr Gly Tyr Ser Leu Val Ala Lys

420 425 430

Thr Asp Val Ile Gly Thr Pro Pro
435 440

<210> 303

<211> 463

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-255 effector

<400> 303

Met Ala Val Phe Val Leu Asp Arg Ser Gly Arg Pro Leu Met Pro Cys
1 5 10 15

Thr Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Cys Val
20 25 30

His Leu Val Met Pro Phe Thr Ile Arg Ile Val Asp Leu Lys Ala Glu
35 40 45

Asn Cys Ala Phe Gln Ala Leu Arg Val Lys Leu Asp Pro Gly Ser Lys
50 55 60

Ala Thr Gly Ile Ala Leu Val Arg Glu Thr Glu Gly Lys Gly Val Ala
65 70 75 80

Val Val Asn Leu Phe Glu Leu Val His Arg Gly Arg Gln Ile Ser Glu
85 90 95

Ala Leu Thr Ala Arg Arg Gly His Arg Arg Leu Arg Arg Ser Lys Leu
100 105 110

Arg Tyr Arg Pro Pro Arg Phe Asp Asn Arg Gly Asn Lys Gln Arg Gly
115 120 125

Trp Leu Ala Pro Ser Leu Gln His Arg Val Asp Thr Ser Met Ala Trp
130 135 140

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

Leu Val Arg Phe Asp Ala Gln Ala Leu Glu Asn Pro Glu Ile Glu Gly

165 170 175

Ala Gln Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr

180 185 190

Leu Leu Glu Lys Trp Asp Arg Thr Cys Ala Tyr Cys Gly Ala Lys Asp

195 200 205

Val Pro Leu Gln Val Glu His Ile Gln Pro Lys Ala Lys Gly Gly Ser

210 215 220

Asn Arg Ile Ile Asn Leu Ala Leu Ala Cys Gln Cys Cys Asn Gln Lys

225 230 235 240

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

245 250 255

Leu Lys Arg Ile Leu Ala Gln Ala Lys Arg Pro Leu Lys Asp Ala Ala

260 265 270

Ala Val Asn Ser Thr Arg Trp Ala Leu Val Asn Ala Leu Lys Ala Thr

275 280 285

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

290 295 300

Ser Gln Phe Asp Ile Pro Lys Thr His Ala Leu Asp Ala Ala Cys Val

305 310 315 320

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

325 330 335

Lys Ala Met Gly Arg Gly Ser Tyr Gln Arg Thr Arg Leu Asp Lys Phe

340 345 350

Gly Cys Val Arg Gly Tyr Leu Thr Arg Ser Lys Ser Ile Lys Gly Phe

355 360 365

Gln Thr Gly Asp Met Val Lys Ala Glu Val Thr Thr Gly Lys Lys Ile

370 375 380

Gly Ser Tyr Thr Gly Arg Val Ala Val Arg Ala Thr Gly Ser Phe Asn

385 390 395 400

Ile Gln Thr Ser Thr Gly Leu Val Gln Gly Val Ser His Arg Tyr Cys

405 410 415

Thr Val Val Gln Arg Gly Asn Gly Tyr Gly Tyr Ser Leu Val Ala Lys
420 425 430
Thr Asp Val Thr Gly Thr Pro Pro Gln His Arg Asp Ala Ser His Pro
435 440 445

Ala Leu Tyr Leu Pro Gly Leu Lys Ala Glu Val Ser Arg Ala Asn
450 455 460

<210> 304
<211> 458
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-256 effector
<400> 304
Met Ala Val Phe Val Leu Asp Arg Ser Gly Arg Pro Leu Met Pro Cys
1 5 10 15
Thr Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Cys Val

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

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

130 135 140

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

145 150 155 160

Leu Val Arg Phe Asp Ala Gln Ala Leu Glu Asn Pro Glu Ile Glu Gly

165 170 175

Ala Gln Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr

180 185 190

Leu Leu Glu Lys Trp Asp Arg Thr Cys Ala Tyr Cys Asp Ala Lys Asp

195 200 205

Val Pro Leu Gln Val Glu His Ile Gln Pro Lys Ala Lys Gly Gly Ser

210 215 220

Asn Arg Ile Ser Asn Leu Ala Leu Ala Cys Gln Cys Cys Asn Gln Lys

225 230 235 240

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

245 250 255

Leu Lys Arg Ile Leu Ala Gln Ala Lys Arg Pro Leu Lys Asp Ala Ala

260 265 270

Ala Val Asn Ser Thr Arg Trp Ala Leu Val Asn Ala Leu Lys Ala Thr

275 280 285

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

290 295 300

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

305 310 315 320

Gly Glu Val Gly Ser Ile Thr Asp Trp Gln Lys Pro Thr Leu Ala Ile

325 330 335

Lys Ala Met Gly Arg Gly Ser Tyr Gln Arg Thr Arg Leu Asp Lys Phe

340 345 350

Gly Cys Val Arg Gly Tyr Met Thr Arg Ser Lys Ser Ile Lys Gly Phe

355 360 365

Gln Thr Gly Asp Met Val Lys Ala Glu Val Thr Lys Gly Lys Lys Ile

370 375 380

Gly Ser Tyr Thr Gly Arg Val Ala Val Arg Ala Thr Gly Ser Phe Asn
385 390 395 400
Ile Gln Thr Ser Ala Gly Leu Val Gln Ser Val Ser His Arg Tyr Cys

405 410 415
Thr Val Val Gln Arg Gly Asn Gly Tyr Gly Tyr Ser Arg Val Ala Lys
420 425 430
Met Asp Val Thr Gly Thr Pro Pro Gln His Arg Asp Ala Ser Ser Arg
435 440 445
Ala Leu Pro Pro Arg Pro Glu Gly Arg Gly
450 455

<210> 305
<211> 884
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors
<220><223> Description: MG35-257 effector
<400> 305
Met Ala Val Phe Val Leu Asp Arg Ser Gly Arg Pro Leu Met Pro Cys
1 5 10 15
Thr Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Cys Val
20 25 30
His Leu Val Met Pro Phe Thr Ile Arg Ile Val Asp Leu Lys Ala Glu
35 40 45
Asn Cys Ala Phe Gln Ala Leu Arg Val Lys Leu Asp Pro Gly Ser Lys

50 55 60
Ala Thr Gly Ile Ala Leu Val Arg Glu Thr Glu Gly Lys Gly Val Ala
65 70 75 80
Val Val Asn Leu Phe Glu Leu Val His Arg Gly Arg Gln Ile Ser Glu
85 90 95
Ala Leu Thr Ala Arg Arg Gly His Arg Arg Leu Arg Arg Ser Lys Leu

100 105 110

Arg Tyr Arg Pro Pro Arg Phe Asp Asn Arg Gly Asn Gln Lys Lys Gly

115 120 125

Trp Leu Pro Pro Ser Leu Gln His Arg Val Asp Thr Ser Met Ala Trp

130 135 140

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

145 150 155 160

Leu Val Arg Phe Asp Met Gln Ala Met Glu Asn Pro Glu Ile Glu Gly

165 170 175

Ala Gln Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr

180 185 190

Leu Leu Glu Lys Trp Asp Arg Thr Cys Ala Tyr Cys Gly Ala Lys Asp

195 200 205

Val Pro Leu Gln Val Glu His Ile Gln Pro Lys Ala Lys Gly Gly Ser

210 215 220

Asn Arg Ile Ser Asn Leu Ala Leu Ala Cys Gln Cys Cys Asn Gln Lys

225 230 235 240

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

245 250 255

Leu Lys Arg Ile Leu Ala Gln Ala Lys Arg Pro Leu Lys Asp Ala Ala

260 265 270

Ala Val Asn Ser Thr Arg Trp Ala Leu Val Asn Thr Leu Lys Thr Thr

275 280 285

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

290 295 300

Ser Gln Phe Asp Ile Pro Lys Thr His Ala Leu Asp Ala Ala Cys Val

305 310 315 320

Gly Glu Val Gly Ser Ile Thr Asp Trp Gln Lys Pro Thr Leu Ala Ile

325 330 335

Lys Ala Met Gly Arg Gly Ser Tyr Gln Arg Thr Leu Leu Asp Lys Phe

340 345 350

Gly Cys Val Arg Gly Tyr Leu Thr Arg Ser Lys Ser Ile Lys Gly Phe

355 360 365

Gln Thr Gly Asp Met Val Lys Ala Glu Val Thr Thr Gly Lys Lys Ile

370 375 380

Gly Ser Tyr Thr Gly Arg Val Ala Val Arg Ala Thr Gly Ser Phe Asn

385 390 395 400

Ile Gln Thr Ser Thr Gly Leu Val Gln Ser Val Ser His Arg Tyr Cys

405 410 415

Thr Val Val Gln Arg Gly Asn Gly Tyr Gly Tyr Ser Leu Val Ala Lys

420 425 430

Met Asp Val Thr Gly Thr Pro Pro Gln His Arg Asp Ala Ser Ser Arg

435 440 445

Ala Leu Pro Pro Arg Pro Glu Gly Arg Gly Phe Thr Arg Lys Leu Met

450 455 460

Phe Asn Glu Gln Lys Leu Ala Glu Thr Val Gly Ser Thr Asn Gly Ser

465 470 475 480

Ala Gln Phe Gly Gly Ala Gly Phe Glu Leu Ala Phe Lys Ala Val Ala

485 490 495

Lys Leu Ser Pro Thr Asn Val Leu Val Phe Phe Asp Gly Glu Gly Ser

500 505 510

Gly Trp Val Met His Ile Ala Pro Asp Val Ser Val Val Cys Ala Ala

515 520 525

Arg Phe Pro Ala Glu Ser Ala Thr Ala Phe Ser Val Met Val Asp Val

530 535 540

Leu Leu Ala Lys Arg Ile Lys Lys Thr His Val Ala Thr Leu Ser Leu

545 550 555 560

Thr Ala Gly Arg Lys Leu Asp Leu Ser Leu Glu Pro Asp Thr Thr Lys

565 570 575

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

580 585 590

Leu Ala Lys Val Val Ala Asp Arg Val Met His Asn Leu Ser Leu Ser

595 600 605

Ser Thr Asp Asn Leu Leu Leu Ser Asn Asp Cys Trp Gln Ala Ile Val

610 615 620

Ala Ser Ile Arg Arg Leu Asp Ile Leu Ala Phe Phe Thr Ala Arg Lys

625 630 635 640

Glu Arg Leu Asp Ile Tyr Ala Cys Ser Gln Pro Asp Gly Asn Leu Tyr

645 650 655

Val Tyr Cys Ala Asp Lys Ala Ser Leu Gly Ala Val Ala Cys Pro Ala

660 665 670

Pro Glu Gly Thr Gly Glu Phe Thr Thr Val Leu Thr Ala Asp Ala Leu

675 680 685

Ala Val Ile Gly Leu Leu Phe Asp Ile Asp Met Glu Glu Asp Gly Ala

690 695 700

Asp Ala Ala Asp Met Val Ala Asn Val Ser Leu Ala Leu Thr Asn Thr

705 710 715 720

Gly Phe Leu Val Tyr Asn Glu Ala Ala Leu Leu Tyr Met Pro Ser Pro

725 730 735

Arg Val Phe Pro Asp Gln Thr Asn Val Thr Leu Pro Lys Val Gln Ala

740 745 750

Met Tyr Gln His Ile Lys Glu Ser Tyr His Ser Asp Asp Asn Gly Gly

755 760 765

Glu Tyr Ser Thr Tyr Cys Asp Val Asp Glu Leu Asp Pro Gln Val Leu

770 775 780

Ala Ser Ser Val Lys Phe Gly Ala Asp Leu Ile Glu Asp Ala Ala Val

785 790 795 800

Arg Leu Leu Thr Gly Thr Glu Glu Tyr Leu Ile Val Glu Met Arg Glu

805 810 815

Asn Ala Ser Ser Ile Gln Ser Ala Ile Pro Ala Leu Ile Ser Ser Ser

820 825 830

Val Asn Val Val Leu Asp Pro Arg Leu Leu Gly Gln Ala Val Ile Asn

835 840 845

Phe Lys Gln Pro Val Arg Leu Lys Val Glu Ser Lys Phe Thr Val Leu
850 855 860
His Ala Phe Val Gln Glu Leu Asp Gly Glu His Phe Ile Leu Ile Gly
865 870 875 880
Asn Gln Arg Glu

<210> 306

<211> 213
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-258 effector
<400> 306
Met Ala Val Phe Val Leu Asp Arg Ser Gly Arg Pro Leu Met Pro Cys
1 5 10 15
Thr Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Cys Val
20 25 30
His Leu Val Met Pro Phe Thr Ile Arg Ile Val Asp Leu Lys Ala Glu

35 40 45
Asn Cys Ala Phe Gln Ala Leu Arg Val Lys Leu Asp Pro Gly Ser Lys
50 55 60
Ala Thr Gly Ile Ala Leu Val Arg Glu Thr Glu Gly Lys Gly Val Ala
65 70 75 80
Val Val Asn Leu Phe Glu Leu Val His Arg Gly Arg Gln Ile Ser Glu
85 90 95
Ala Leu Thr Ala Arg Arg Gly His Arg Arg Leu Arg Arg Ser Lys Leu

100 105 110
Arg Tyr Arg Pro Pro Arg Phe Asp Asn Arg Gly Ser Lys Gln Arg Gly
115 120 125
Trp Leu Ala His Ser Leu Gln His Arg Val Asp Thr Ser Met Ala Trp

130 135 140

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

145 150 155 160

Leu Val Arg Phe Asp Met Gln Ala Met Glu Asn Pro Glu Ile Glu Gly

165 170 175

Met Gln Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr

180 185 190

Leu Leu Glu Lys Trp Asp Arg Thr Cys Ala Tyr Cys Gly Ala Lys Asp

195 200 205

Val Pro Leu Gln Val

210

<210> 307

<211> 304

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-259 effector

<400> 307

Met Ala Val Phe Val Leu Asp Arg Ser Gly Arg Pro Leu Met Pro Cys

1 5 10 15

Thr Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Cys Val

20 25 30

His Leu Val Met Pro Phe Thr Ile Arg Ile Val Asp Leu Lys Ala Glu

35 40 45

Asn Cys Ala Phe Gln Ala Leu Arg Val Lys Leu Asp Pro Gly Ser Lys

50 55 60

Ala Thr Gly Ile Ala Leu Val Arg Glu Thr Glu Gly Lys Gly Val Ala

65 70 75 80

Val Val Asn Leu Phe Glu Leu Val His Arg Gly Arg Gln Ile Ser Glu

85 90 95

Ala Leu Thr Ala Arg Arg Gly His Arg Arg Leu Arg Arg Ser Lys Leu
100 105 110
Arg Tyr Arg Pro Pro Arg Phe Asn Asn Arg Gly Asn Lys Gln Arg Gly

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

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

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

<210> 308

<211> 463

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-260 effector

<400> 308

Met Ala Val Phe Val Leu Asp Arg Ser Gly Arg Pro Leu Met Pro Cys
1 5 10 15

Thr Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Cys Val
20 25 30

His Leu Val Met Pro Phe Thr Ile Arg Ile Val Asp Leu Lys Ala Glu
35 40 45

Asn Cys Ala Phe Gln Ala Leu Arg Val Lys Leu Asp Pro Gly Ser Lys
50 55 60

Ala Thr Gly Ile Ala Leu Val Arg Glu Thr Glu Gly Lys Gly Val Ala
65 70 75 80

Val Val Asn Leu Phe Glu Leu Val His Arg Gly Arg Gln Ile Ser Glu
85 90 95

Ala Leu Thr Ala Arg Arg Gly Asn Arg Arg Leu Arg Arg Ser Lys Leu
100 105 110

Arg Tyr Arg Pro Pro Arg Phe Asn Asn Leu Gly Asn Lys Gln Arg Gly
115 120 125

Trp Leu Ala Pro Ser Leu Gln His Arg Val Asp Thr Ser Met Ala Trp
130 135 140

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

Leu Val Arg Phe Asp Met Gln Ala Met Glu Asn Pro Glu Ile Glu Gly
165 170 175

Met Gln Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr
180 185 190

Leu Leu Glu Lys Trp Asp Arg Thr Cys Ala Tyr Cys Gly Ala Lys Asp
195 200 205

Val Pro Leu Gln Ile Glu His Ile Arg Pro Lys Ser Lys Asn Gly Ser
210 215 220

Asp Arg Ile Asn Asn Leu Thr Leu Ala Cys Gln Cys Cys Asn Gln Lys
225 230 235 240

Lys Ala Ala Leu Ser Val Glu Met Phe Leu Ala Lys Lys Pro Glu Leu
245 250 255

Leu Lys Arg Ile Leu Ala Gln Ala Lys Arg Pro Leu Lys Asp Ala Ala
260 265 270

Ala Val Asn Ser Thr Arg Trp Ala Leu Val Asn Thr Leu Lys Thr Thr
275 280 285

Gly Leu Val Val Glu Thr Gly Thr Gly Gly Gln Thr Lys Phe Asn Arg
290 295 300

Ser Gln Phe Asp Ile Pro Lys Thr His Ala Leu Asp Ala Ala Cys Val
305 310 315 320

Gly Glu Val Gly Ser Ile Thr Asp Trp Gln Lys Pro Thr Leu Ala Ile
325 330 335

Lys Ala Met Gly Arg Gly Arg Tyr Gln Arg Thr Arg Leu Asp Lys Phe
340 345 350

Gly Cys Val Arg Gly Tyr Leu Ile Arg Ser Lys Ser Ile Lys Gly Phe
355 360 365

Gln Thr Gly Asp Met Val Lys Ala Glu Val Thr Thr Gly Lys Lys Ile
370 375 380

Gly Ser Tyr Thr Gly Arg Val Ala Val Arg Ala Thr Gly Ser Phe Asn
385 390 395 400

Ile Gln Thr Ser Ala Gly Leu Val Gln Gly Val Ser His Arg Tyr Cys
405 410 415

Thr Val Val Gln Arg Gly Asn Gly Tyr Gly Tyr Ser Leu Val Ala Lys
420 425 430

Thr Asp Val Arg Gly Thr Pro Pro Gln His Arg Asp Ala Ser His Pro
435 440 445

Ala Leu Tyr Leu Pro Gly Met Asn Ala Glu Val Ser Arg Ala Ile
450 455 460

<210> 309

<211> 426

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-261 effector

<400> 309

Met Ala Val Phe Val Leu Asp Arg Ser Gly Arg Pro Leu Met Pro Cys

1 5 10 15

Thr Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Cys Val

20 25 30

His Met Val Met Pro Phe Thr Ile Arg Ile Val Asp Leu Lys Ala Glu

35 40 45

Asn Cys Ala Phe Gln Ala Leu Arg Val Lys Leu Asp Pro Gly Ser Lys

50 55 60

Ala Thr Gly Ile Ala Leu Val Arg Glu Thr Glu Gly Lys Gly Val Ala

65 70 75 80

Val Val Asn Leu Phe Glu Leu Val His Arg Gly Arg Gln Ile Ser Glu

85 90 95

Ala Leu Thr Ala Arg Arg Gly Asn Arg Arg Leu Arg Arg Ser Lys Leu

100 105 110

Arg Tyr Arg Pro Pro Arg Phe Asn Asn Arg Gly Asn Lys Gln Arg Gly

115 120 125

Trp Leu Ala Pro Ser Leu Gln His Arg Val Asp Thr Ser Met Ala Trp

130 135 140

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

145 150 155 160

Leu Val Arg Phe Asp Ala Gln Ala Leu Glu Asn Pro Glu Ile Glu Gly

165 170 175

Ala Gln Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr

180 185 190

Leu Leu Glu Lys Trp Asp Arg Thr Cys Ala Tyr Cys Gly Ala Lys Asp

195 200 205

Val Pro Leu Gln Ile Glu His Ile His Pro Lys Ser Lys Asn Gly Ser

210 215 220

Asp Arg Ile Asn Asn Leu Thr Leu Ala Cys Gln Cys Cys Asn Gln Lys

225 230 235 240

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

245 250 255

Leu Lys Arg Ile Leu Ala Gln Ala Lys Arg Pro Leu Lys Asp Ala Ala

260 265 270

Ala Val Asn Ser Thr Arg Trp Ala Leu Val Asn Thr Leu Lys Thr Thr

275 280 285

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

290 295 300

Ser Gln Phe Asp Ile Pro Lys Thr His Ala Leu Asp Ala Ala Cys Val

305 310 315 320

Gly Glu Val Gly Ser Ile Thr Asp Trp Gln Lys Pro Thr Leu Ala Ile

325 330 335

Lys Ala Met Gly Arg Gly Ser Tyr Gln Arg Thr Arg Leu Asp Lys Phe

340 345 350

Gly Cys Val Arg Gly Tyr Leu Thr Arg Ser Lys Ser Ile Lys Gly Phe

355 360 365

Gln Thr Gly Asp Met Val Lys Ala Glu Val Thr Thr Gly Lys Lys Ile

370 375 380

Gly Ser Tyr Thr Gly Arg Val Ala Val Arg Ala Thr Gly Ser Phe Asn

385 390 395 400

Ile Gln Thr Ser Ala Gly Leu Val Gln Gly Val Ser His Arg Tyr Cys

405 410 415

Ala Val Val Gln Arg Gly Asn Gly Tyr Gly

420 425

<210> 310

<211> 39

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-262 effector

<400> 310

Met Ala Val Phe Val Leu Asp Arg Ser Lys His Pro Leu Met Pro Cys

1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Arg Val

20 25 30

His Arg Leu Val Pro Phe Thr

35

<210> 311

<211> 245

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-263 effector

<400> 311

Met Ala Val Phe Val Leu Asp Arg Ser Lys His Pro Leu Met Pro Cys

1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Arg Val

20 25 30

His Arg Leu Val Pro Phe Thr Ile Arg Leu Val Asp Arg Arg Val Glu

35 40 45

Thr Ser Val Leu Gln Pro Leu Arg Leu Lys Leu Asp Pro Gly Ser Lys

50 55 60

Val Thr Gly Leu Ala Ile Val Arg Glu Ala Gly Asp Thr His His Val

65 70 75 80

Leu His Leu Thr Glu Leu His His Arg Gly Ala Ser Ile Arg Lys Ala

85 90 95

Leu Gln Gln Arg Lys Asn Tyr Arg Arg Gly Arg Arg Ser Arg Asn Leu

100 105 110

Arg Tyr Arg Ala Pro Arg Phe Leu Asn Arg Arg Arg Ala Asp Gly Trp

115 120 125

Leu Ala Pro Ser Leu Gln His Arg Met Val Thr Thr Glu Thr Trp Val

130 135 140

Lys Arg Tyr Arg Ser Leu Ala Pro Ile Val Ala Leu Thr Val Glu Arg

145 150 155 160

Val Arg Phe Asp Leu Gln Gln Met Val Thr Pro Glu Ile Ser Gly Val

165 170 175

Glu Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu

180 185 190

Leu Glu Lys Phe Gly Arg Gln Cys Val Tyr Cys Asp Arg Thr Asp Arg

195 200 205

Pro Leu Gln Ile Glu His Leu Thr Pro Lys Gly Ser Gly Gly Ser Asp

210 215 220

Arg Val Ser Asn Leu Ala Leu Ala Cys Glu Ser Cys Asn Ala Ala Lys

225 230 235 240

Gly Asn Arg Thr Val

245

<210> 312

<211> 319

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-264 effector

<400> 312

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

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

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

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

245 250 255

Asp Arg Ile Leu Arg Gln Ala Gln Gln Pro Leu Arg Asp Ala Ala Ala

260 265 270

Val Asn Ala Thr Arg Trp Ala Ile Trp Glu Ile Leu Thr Lys Thr Gly

275 280 285

Leu Pro Val Glu Ser Thr Thr Gly Gly Arg Thr Lys Trp Asn Arg Ser

290 295 300

Arg Leu Gly Ile Pro Lys Arg Asp Ala Phe Asp Ala Ala Cys Ala

305 310 315

<210> 313

<211> 373

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-265 effector

<400> 313

Met Ala Val Phe Val Leu Asp Arg Ser Lys His Pro Leu Met Pro Cys

1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Arg Val

20 25 30

His Arg Leu Val Pro Phe Thr Ile Arg Leu Val Asp Arg Arg Val Glu

35 40 45

Thr Ser Val Leu Gln Pro Leu Arg Leu Lys Leu Asp Pro Gly Ser Lys

50 55 60

Val Thr Gly Leu Ala Ile Val Arg Glu Ala Gly Asp Thr His His Val

65 70 75 80

Leu His Leu Thr Glu Leu His His Arg Gly Ala Ser Ile Arg Lys Ala

85 90 95

Leu Gln Gln Arg Lys Asn Tyr Arg Arg Gly Arg Arg Ser Arg Asn Leu

100 105 110

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

Val Arg Phe Asp Leu Gln Gln Met Val Thr Pro Glu Ile Ser Gly Val
165 170 175
Glu Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu
180 185 190
Leu Glu Lys Phe Gly Arg Gln Cys Val Tyr Cys Asp Arg Thr Asp Arg
195 200 205
Pro Leu Gln Ile Glu His Leu Thr Pro Lys Gly Ser Gly Gly Ser Asp
210 215 220

Arg Val Ser Asn Leu Ala Leu Ala Cys Glu Ser Cys Asn Ala Ala Lys
225 230 235 240
Gly Asn Arg Thr Val Glu His Tyr Leu Ala His Asp Pro Ile Arg Arg
245 250 255
Asp Arg Ile Leu Arg Gln Ala Gln Gln Pro Val Arg Asp Ala Ala Ala
260 265 270
Val Asn Gly Thr Arg Trp Ala Ile Trp Glu Ile Leu Thr Lys Thr Gly
275 280 285

Leu Pro Val Glu Cys Thr Thr Gly Gly Arg Thr Lys Trp Asn Arg Ser
290 295 300
Arg Leu Gly Ile Pro Lys Arg Asp Ala Phe Asp Ala Ala Cys Ala Gly
305 310 315 320
Thr Val Asp Gln Val Leu Gly Trp Asp Arg Pro Ile Gln Arg Ile Asp
325 330 335
Cys Leu Gly Arg Gly Ser His Gln Arg Thr Arg Val Thr Lys Asp Gly
340 345 350

Val Pro Arg Gly Tyr Leu Pro Arg Thr Gln Ile Arg Gln Gly Val Arg

355 360 365

Thr Gly His Gln Val

370

<210> 314

<211> 323

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-266 effector

<400> 314

Met Ala Val Phe Val Leu Asp Arg Ser Lys His Pro Leu Met Pro Cys

1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Arg Val

20 25 30

His Arg Leu Val Pro Phe Thr Ile Arg Leu Val Asp Arg Arg Val Glu

35 40 45

Thr Ser Val Leu Gln Pro Leu Arg Leu Lys Leu Asp Pro Gly Ser Lys

50 55 60

Val Thr Gly Val Ala Val Val Arg Glu Ala Gly Asp Thr His His Val

65 70 75 80

Leu His Leu Ser Glu Leu His His Arg Gly Ala Ser Ile Arg Lys Thr

85 90 95

Leu Gln Gln Arg Lys Asn Tyr Arg Arg Gly Arg Arg Thr Arg Asn Leu

100 105 110

Arg His Arg Ala Pro Arg Phe Leu Asn Arg Arg Arg Pro Glu Gly Trp

115 120 125

Leu Ala Pro Ser Leu Leu His Arg Val Val Thr Thr Glu Thr Trp Val

130 135 140

Lys Arg Tyr Arg Ala Leu Ala Pro Ile Val Ala Leu Thr Val Glu Arg

145 150 155 160

Val Arg Phe Asp Met Gln Gln Met Val Ser Pro Glu Leu Ser Gly Leu
165 170 175
Ala Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu
180 185 190
Leu Glu Lys Trp Gly Arg Thr Cys Val Cys Cys Asp Arg Thr Asp Arg
195 200 205

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

Val Asn Ala Thr Arg Trp Ala Ile Trp Glu Met Leu Thr Arg Thr Gly
275 280 285
Leu Ala Val Glu Ala Thr Thr Gly Gly Arg Thr Lys Trp Asn Arg Ala
290 295 300
Arg Met Gly Ile Pro Lys Arg Asp Ala Trp Asp Ala Ala Cys Ala Gly
305 310 315 320
Thr Val Asp

<210> 315
<211> 259
<212> PRT
<213> Unknown
<220><223> Description of Unknown:

uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-267 effector
<400> 315
Met Ala Val Phe Val Leu Asp Arg Ser Lys His Pro Leu Met Pro Cys

1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Arg Val

20 25 30

His Arg Leu Val Pro Phe Thr Ile Arg Leu Val Asp Arg Arg Val Glu

35 40 45

Thr Ser Val Leu Gln Pro Leu Arg Leu Lys Leu Asp Pro Gly Ser Lys

50 55 60

Val Thr Gly Val Ala Val Val Arg Glu Ala Gly Asp Thr His His Val

65 70 75 80

Leu His Leu Thr Glu Leu His His Arg Gly Ala Ser Ile Arg Lys Thr

85 90 95

Leu Gln Gln Arg Lys Asn Tyr Arg Arg Gly Arg Arg Thr Arg Asn Leu

100 105 110

Arg His Arg Ala Pro Arg Phe Leu Asn Arg Arg Arg Pro Glu Gly Trp

115 120 125

Leu Ala Pro Ser Leu Leu His Arg Val Val Thr Thr Glu Thr Trp Val

130 135 140

Lys Arg Tyr Arg Ala Leu Ala Pro Ile Val Ala Leu Thr Val Glu Arg

145 150 155 160

Val Arg Phe Asp Met Gln Leu Met Val Ser Pro Glu Ile Ser Gly Ile

165 170 175

Ala Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu

180 185 190

Leu Glu Lys Trp Gly Arg Thr Cys Val Cys Cys Asp Arg Thr Asp Arg

195 200 205

Pro Leu Gln Val Glu His Leu Thr Pro Lys Gly Ser Gly Gly Ser Asp

210 215 220

Arg Ile Ser Asn Leu Ala Leu Ala Cys Gln Pro Cys Asn Glu Ala Lys

225 230 235 240

Gly Asn Gln Thr Val Glu Val Tyr Leu Ile Ser Asp Pro Ile Arg Arg

245 250 255

Asp Arg Ile

<210> 316

<211> 466

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-268 effector

<400> 316

Met Ala Val Phe Val Leu Asp Arg Ser Lys His Pro Leu Met Pro Cys

1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Arg Val

20 25 30

His Arg Leu Val Pro Phe Thr Ile Arg Leu Val Asp Arg Ser Val Glu

35 40 45

Thr Ser Val Leu Gln Pro Leu Arg Leu Lys Leu Asp Pro Gly Ser Lys

50 55 60

Val Thr Gly Leu Ala Ile Val Arg Glu Ala Gly Asp Thr His His Val

65 70 75 80

Leu His Leu Ala Glu Val His His Arg Gly Ala His Ile Arg Lys Val

85 90 95

Leu Gln Gln Arg Ala Gly Tyr Arg Arg Gly Arg Arg Ser Arg Asn Leu

100 105 110

Arg Tyr Arg Ala Pro Arg Phe Leu Asn Arg Arg Arg Pro Asp Gly Trp

115 120 125

Leu Ala Pro Ser Leu Gln His Arg Met Val Thr Ala Glu Thr Trp Val

130 135 140

Lys Arg Tyr Arg Ser Leu Ala Pro Ile Val Ala Leu Thr Val Glu Arg

145 150 155 160

Val Arg Phe Asp Leu Gln Gln Met Val Thr Pro Glu Ile Ser Gly Val

165 170 175

Glu Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu

180 185 190

Leu Glu Lys Trp Gly Arg Thr Cys Val Tyr Cys Asp Trp Thr Asp Arg

195 200 205

Pro Leu Gln Val Glu His Leu Ile Pro Lys Gly Ser Gly Gly Ser Asp

210 215 220

Arg Val Ser Asn Leu Ala Leu Ala Cys Glu Ser Cys Asn Ala Ala Lys

225 230 235 240

Gly Asn Gln Thr Val Glu Ala Tyr Leu Ala His Asp Pro Val Arg Arg

245 250 255

Asp Arg Ile Leu Gln Gln Ala Gln Gln Pro Leu Arg Asp Ala Ala Ala

260 265 270

Val Asn Ala Thr Arg Trp Ala Ile Trp Glu Met Leu Thr Lys Thr Gly

275 280 285

Leu Asp Val Glu Ala Thr Thr Gly Gly Arg Thr Lys Trp Asn Arg Ser

290 295 300

Arg Leu Gly Ile Pro Lys Arg Asp Ala Trp Asp Ala Ala Cys Ala Gly

305 310 315 320

Thr Ile Glu Gln Val Val Gly Trp Asp Arg Pro Ile Gln Arg Ile Asp

325 330 335

Cys Leu Gly Arg Gly Ser His Gln Arg Thr Arg Val Thr Lys Asp Gly

340 345 350

Phe Pro Arg Gly Tyr Leu Pro Arg Thr Lys Met Val Arg Gly Phe Arg

355 360 365

Thr Gly Asp His Val Arg Ala Thr Val Pro Thr Gly Lys Lys Thr Gly

370 375 380

Thr Trp Ile Gly Arg Val Ala Val Arg Thr Thr Gly Ser Phe Asp Ile

385 390 395 400

Gln Thr Val Ala Lys Thr Val Gln Gly Ile Ser Ala Arg Trp Cys Val

405 410 415

Leu Leu Gln Arg Gly Asp Gly Tyr Arg Tyr Ser Arg Val Glu Ser Glu
420 425 430
Pro Pro Leu Ala Val Arg Pro Ser Ser Arg Arg Pro Lys Ala Thr Leu
435 440 445
Ser Gly Pro Arg Val Ser Leu Val Thr Thr Arg Ser Leu Glu Gly Ser
450 455 460
Gly Arg
465

<210> 317

<211> 185

<212

> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-269 effector

<400> 317

Met Ala Val Phe Val Leu Asp Arg Ser Lys His Pro Leu Met Pro Cys
1 5 10 15
Ser Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Arg Val
20 25 30
His Arg Leu Val Pro Phe Thr Ile Arg Leu Val Asp Arg Ser Val Glu
35 40 45
Thr Ser Val Leu Gln Pro Leu Arg Leu Lys Leu Asp Pro Gly Ser Lys
50 55 60
Val Thr Gly Leu Ala Ile Val Arg Glu Ala Gly Asp Thr His His Val
65 70 75 80
Leu His Leu Ala Glu Val His His Arg Gly Ala His Ile Arg Lys Val
85 90 95
Leu Gln Gln Arg Ala Gly Tyr Arg Arg Gly Arg Arg Ser Arg Asn Leu
100 105 110
Arg Tyr Arg Ala Pro Arg Phe Leu Asn Arg Arg Arg Pro Asp Gly Trp

115 120 125

Leu Ala Pro Ser Leu Gln His Arg Met Val Thr Thr Glu Thr Trp Val

130 135 140

Lys Arg Tyr Arg Ser Leu Ala Pro Ile Val Ala Leu Thr Val Glu Arg

145 150 155 160

Val Arg Phe Asp Leu Gln Gln Met Val Thr Pro Glu Ile Ser Gly Val

165 170 175

Glu Tyr Gln Gln Gly Thr Leu Ala Gly

180 185

<210> 318

<211> 466

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-270 effector

<400> 318

Met Ala Val Phe Val Leu Asp Arg Ser Lys His Pro Leu Met Pro Cys

1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Arg Val

20 25 30

His Arg Leu Val Pro Phe Thr Ile Arg Leu Val Asp Arg Ser Val Glu

35 40 45

Thr Ser Val Leu Gln Pro Leu Arg Leu Lys Leu Asp Pro Gly Ser Lys

50 55 60

Val Thr Gly Leu Ala Ile Val Arg Glu Ala Gly Asp Thr His His Val

65 70 75 80

Leu His Leu Ala Glu Val His His Arg Gly Ala His Ile Arg Lys Val

85 90 95

Leu Gln Gln Arg Ala Gly Tyr Arg Arg Gly Arg Arg Ser Arg Asn Leu

100 105 110

Arg Tyr Arg Ala Pro Arg Phe Leu Asn Arg Arg Arg Pro Asp Gly Trp

115 120 125

Leu Ala Pro Ser Leu Gln His Arg Met Val Thr Thr Glu Thr Trp Val

130 135 140

Lys Arg Tyr Arg Ser Leu Ala Pro Ile Val Ala Leu Thr Val Glu Arg

145 150 155 160

Val Arg Phe Asp Leu Gln Gln Met Val Thr Pro Glu Ile Ser Gly Val

165 170 175

Glu Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu

180 185 190

Leu Glu Lys Trp Gly Arg Thr Cys Val Tyr Cys Asp Trp Thr Asp Arg

195 200 205

Pro Leu Gln Val Glu His Leu Ile Pro Lys Gly Ser Gly Gly Ser Asp

210 215 220

Arg Val Ser Asn Leu Ala Leu Ala Cys Glu Ser Cys Asn Ala Ala Lys

225 230 235 240

Gly Asn Gln Thr Val Glu Ala Tyr Leu Ala His Asp Pro Val Arg Arg

245 250 255

Asp Arg Ile Leu Gln Gln Ala Gln Gln Pro Leu Arg Asp Ala Ala Ala

260 265 270

Val Asn Ala Thr Arg Trp Ala Ile Trp Glu Met Leu Thr Lys Thr Gly

275 280 285

Leu Asp Val Glu Ala Thr Thr Gly Gly Arg Thr Lys Trp Asn Arg Ser

290 295 300

Arg Leu Gly Ile Pro Lys Arg Asp Ala Trp Asp Ala Ala Cys Ala Gly

305 310 315 320

Thr Ile Glu Gln Val Val Gly Trp Asp Arg Pro Ile Gln Arg Ile Asp

325 330 335

Cys Leu Gly Arg Gly Ser His Gln Arg Thr Arg Val Thr Lys Asp Gly

340 345 350

Phe Pro Arg Gly Tyr Leu Pro Arg Thr Lys Met Val Arg Gly Phe Arg

355 360 365

Thr Gly Asp His Val Arg Ala Thr Val Pro Thr Gly Lys Lys Thr Gly

370 375 380

Thr Trp Ile Gly Arg Val Ala Val Arg Thr Thr Gly Ser Phe Asp Ile

385 390 395 400

Gln Thr Val Ala Lys Thr Val Gln Gly Ile Ser Ala Arg Trp Cys Val

405 410 415

Leu Leu Gln Arg Gly Asp Gly Tyr Arg Tyr Ser Arg Val Glu Ser Glu

420 425 430

Pro Pro Leu Ala Val Arg Pro Ser Ser Arg Arg Pro Lys Ala Thr Leu

435 440 445

Ser Gly Pro Arg Val Ser Leu Val Thr Thr Arg Ser Leu Glu Gly Ser

450 455 460

Gly Arg

465

<210> 319

<211> 274

<212

> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-271 effector

<400> 319

Met Ala Val Phe Val Leu Asp Arg Ser Lys His Pro Leu Met Pro Cys

1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Arg Val

20 25 30

His Arg Leu Val Pro Phe Thr Ile Arg Leu Val Asp Arg Ser Val Glu

35 40 45

Thr Ser Val Leu Gln Pro Leu Arg Leu Lys Leu Asp Pro Gly Ser Lys

50 55 60

Val Thr Gly Leu Ala Ile Val Arg Glu Ala Gly Asp Thr His His Val
65 70 75 80
Leu His Leu Ala Glu Val His His Arg Gly Ala His Ile Arg Lys Val
85 90 95
Leu Gln Gln Arg Ala Gly Tyr Arg Arg Gly Arg Trp Ser Arg Asn Leu

100 105 110
Arg Tyr Arg Ala Pro Arg Phe Leu Asn Arg Arg Arg Pro Asp Gly Trp
115 120 125
Leu Ala Pro Ser Leu Gln His Arg Met Val Thr Thr Glu Thr Trp Val
130 135 140
Lys Arg Tyr Arg Ser Leu Ala Pro Ile Val Ala Leu Thr Val Glu Arg
145 150 155 160
Val Arg Phe Asp Leu Gln Gln Met Val Thr Pro Glu Ile Ser Gly Val

165 170 175
Glu Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu
180 185 190
Leu Glu Lys Phe Gly Arg Gln Cys Val Tyr Cys Asp Arg Thr Asp Arg
195 200 205
Pro Leu Gln Ile Glu His Leu Thr Pro Lys Gly Ser Gly Gly Ser Asp
210 215 220
Arg Val Ser Asn Leu Ala Leu Ala Cys Glu Ser Cys Asn Ala Ala Lys

225 230 235 240
Gly Asn Arg Thr Val Glu His Tyr Leu Ala His Asp Pro Ile Arg Arg
245 250 255
Asp Arg Ile Leu Arg Gln Ala Gln Gln Pro Leu Arg Asp Ala Ala Ala
260 265 270
Val Asn

<210> 320
<211> 443
<212> PRT
<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220

><223> Description: MG35-272 effector

<400> 320

Met Ala Val Phe Val Leu Asp Arg Ser Lys His Pro Leu Met Pro Cys
1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Arg Val
20 25 30

His Arg Leu Val Pro Phe Thr Ile Arg Leu Val Asp Arg Thr Val Ala
35 40 45

Thr Ser Val Leu Gln Pro Leu Arg Leu Lys Leu Asp Pro Gly Ser Lys

50 55 60

Val Thr Gly Leu Ala Ile Val Arg Glu Glu Gly Glu Thr His His Val
65 70 75 80

Leu His Leu Ala Glu Val His His Arg Gly Ala Pro Ile Arg Lys Ala
85 90 95

Leu Gln Gln Arg Ala Gly Tyr Arg Arg Gly Arg Arg Ser Arg Lys Leu
100 105 110

Arg His Arg Ala Pro Arg Phe Leu Asn Arg Arg Arg Asp Asp Gly Trp

115 120 125

Leu Ala Pro Ser Leu Gln His Arg Val Leu Thr Thr Gln Thr Trp Val
130 135 140

Lys Arg Tyr Arg Ala Leu Ala Pro Ile Val Ala Leu Thr Val Glu Arg
145 150 155 160

Val Arg Phe Asp Met Gln Gln Met Val Thr Pro Glu Ile Ser Gly Val
165 170 175

Glu Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu

180 185 190

Leu Glu Lys Trp Gly Arg Thr Cys Val Tyr Cys Asp His Thr Asp Arg
195 200 205

Pro Leu Gln Val Glu His Leu Thr Pro Thr Gly Ser Gly Gly Ser Asp
210 215 220
Gln Val Ser Asn Leu Ala Leu Ala Cys Glu Ser Cys Asn Ala Ala Lys
225 230 235 240
Gly Asn Gln Thr Val Glu Val Tyr Leu Ala Asp Asp Pro Val Arg Arg

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

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

370 375 380
Thr Trp Thr Gly Arg Val Ala Val Arg Ser Thr Gly Ser Phe Asn Ile
385 390 395 400
Gln Thr Gly Ala Ala Thr Ile Gln Gly Ile Ala Ala Arg Trp Cys Val
405 410 415
Leu Leu Gln Arg Gly Asp Gly Tyr Arg Tyr Ser Leu Ala Leu Pro Arg
420 425 430
Thr Glu His Ala Ile Arg Pro Ser Ser Val Ala
435 440

<210> 321

<211> 35

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-273 effector

<400> 321

Met Ala Val Phe Val Leu Asp Thr Gln Gly Gln Ala Leu Met Pro Cys

1 5 10 15

Thr Glu Lys Arg Ala Arg Leu Leu Leu Ala Arg Gly Arg Ala Arg Val

20 25 30

His Arg Leu

35

<210> 322

<211> 53

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-274 effector

<400> 322

Met Ala Val Phe Val Leu Ser Lys Asn Lys Lys Pro Leu Met Pro Cys

1 5 10 15

Ser Glu Lys Arg Ala Arg Ile Leu Leu Ser Lys Lys Gln Ala Val Val

20 25 30

His Gln His His Pro Phe Thr Ile Arg Leu Lys Lys Gln Thr Gly Asn

35 40 45

Glu Thr Gln Pro Ile

50

<210> 323

<211> 430

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-275 effector

<400> 323

Met Ala Val Phe Val Leu Ser Lys Asn Lys Lys Pro Leu Met Pro Cys
1 5 10 15

Ser Glu Lys Arg Ala Arg Ile Leu Leu Ser Lys Lys Gln Ala Val Val

20 25 30

His Gln His Tyr Pro Phe Thr Ile Arg Leu Lys Lys Gln Thr Gly Asn
35 40 45

Glu Thr Gln Pro Ile Gln Leu Lys Ile Asp Pro Gly Ser Arg Tyr Thr
50 55 60

Gly Val Ala Leu Val Met Asp Leu Pro Thr Leu Met Arg Ala Leu Cys
65 70 75 80

Leu Phe Glu Ile Gln His Arg Gly His Gln Ile Ser Glu Ala Leu Thr

85 90 95

Gln Arg Arg Ala Phe Arg Arg Arg Arg Arg Asn Gln Leu Arg Tyr Arg
100 105 110

Pro Ala Arg Phe Asn Asn Arg Thr Arg Lys Ala Gly Trp Leu Pro Pro
115 120 125

Ser Val Gln His Leu Leu Asp Thr Thr Phe Ala Leu Val Gln Lys Leu
130 135 140

Lys Arg Arg Cys Pro Ile Ser Ala Ile Val Phe Glu Gln Val Lys Phe

145 150 155 160

Asp Met Gln Lys Met Gln Asn Pro Asn Ile Gln Gly Val Glu Tyr Gln

165 170 175

His Gly Thr Leu Phe Gln Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys
180 185 190

His Arg His Thr Cys Ala Tyr Cys Gly Gly Glu Ser Gln Asp Ala Ile

195 200 205

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

210 215 220

Ile Arg Asn Leu Val Ile Ala Cys His Thr Cys Asn Gln Thr Lys Gly

225 230 235 240

Asn Arg Thr Leu Ser Glu Phe Leu Thr Val Leu Lys Asn Thr Lys Leu

245 250 255

Asp Lys Val Arg Lys Val Asn Ile Ala Gln Ile Leu Ala Gly Lys Val

260 265 270

Phe Leu Leu Arg Asp Ala Ser Ala Val Asn Ala Cys Arg His Gln Leu

275 280 285

Gly Lys Thr Leu Leu Thr Leu Ser Leu Pro Val Ser Thr Gly Thr Gly

290 295 300

Ala Gln Thr Lys Tyr Asn Arg Met His Tyr Gln Leu Pro Lys Ser His

305 310 315 320

Ala Leu Asp Ala Leu Met Thr Gly Asn Met Glu Lys Pro Ile Glu Ala

325 330 335

Trp His Lys Pro Thr Leu Ile Val Lys Ala Met Gly Arg Gly Cys Tyr

340 345 350

Lys Arg Thr Arg Leu Asn Gln Tyr Gly Phe Pro Arg Gly Tyr Leu Gln

355 360 365

Arg Lys Lys Ile Tyr Phe Gly Phe Gln Thr Gly Asp Leu Val Val Ser

370 375 380

Thr Val Leu Lys Gly Lys Lys Ile Gly Thr Tyr Ile Gly Arg Leu Ala

385 390 395 400

Val Arg Asp Ser Gly Tyr Phe Asn Ile Gln Thr Pro Thr Gly Val Ile

405 410 415

Gln Gly Ile Ser His Lys Thr Cys Arg Leu Ile Gln Arg Asn

420 425 430

<210> 324

<211> 31

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-276 effector

<400> 324

Met Ala Val Phe Val Val Asp Lys Arg Lys Lys Pro Leu Met Pro Cys
1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Lys Ala Val
20 25 30

<210> 325

<211> 281

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-277 effector

<400> 325

Met Ala Val Phe Val Val Asp Arg His Lys Lys Pro Leu Met Pro Cys
1 5 10 15

Ser Glu Lys Arg Ala Arg Lys Leu Leu Ala Arg Gly Arg Ala Arg Val
20 25 30

His Arg Leu Met Pro Phe Ala Ile Arg Leu Val Asp Arg Thr Val Asn
35 40 45

Glu Ser Val Leu Gln Pro Ala Lys Ile Lys Leu Asp Pro Gly Ser Lys
50 55 60

Thr Thr Gly Ile Ala Val Val Arg Glu Ser Ala Thr Ala Asp Glu Glu
65 70 75 80

Thr Gly Glu Ile His Thr Thr Val His Val Leu Asn Leu Leu Glu Leu
85 90 95

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

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

210 215 220
His Pro Arg Ala Gly Gly Gly Ser His Arg Val Ser Asn Leu Thr Leu
225 230 235 240
Ala Cys Gln Pro Cys Asn Gln Lys Lys Gly Ala Gln Glu Ile Asn Ile
245 250 255
Phe Leu Ala Lys Asp Pro Lys Arg Leu Ala Arg Ile Gln Ala Gln Ala
260 265 270
Lys Ala Pro Leu Lys Asp Ala Ala Ala
275 280

<210> 326
<211> 455
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-278 effector

<400> 326

Met Ala Val Phe Val Val Asp Arg His Lys Lys Pro Leu Met Pro Cys
1 5 10 15
Ser Glu Lys Arg Ala Arg Lys Leu Leu Ala Arg Gly Arg Ala Arg Val
20 25 30
His Arg Leu Met Pro Phe Ala Ile Arg Leu Val Asp Arg Thr Val Asn
35 40 45
Glu Ser Val Leu Gln Pro Ala Lys Ile Lys Leu Asp Pro Gly Ser Lys
50 55 60
Thr Thr Gly Ile Ala Val Val Arg Glu Ser Ala Thr Ala Asp Glu Glu
65 70 75 80
Thr Gly Glu Ile His Thr Thr Val His Val Leu Asn Leu Leu Glu Leu
85 90 95
His His Arg Gly Lys Gln Ile Ser Glu Ser Leu Thr Ala Arg Arg Gln
100 105 110
Leu Arg Arg Arg Arg Arg Gly Asn Leu Arg Tyr Arg Lys Pro Arg Phe
115 120 125
Leu Asn Arg Ala Lys Pro Lys Gly Trp Leu Ala Pro Ser Leu Gln His
130 135 140
Arg Val Asp Thr Ile Gly Ala Trp Val Asn Arg Phe Gln Gln Leu Ala
145 150 155 160
Pro Ile Thr Gly Ile Asp Gln Glu Leu Val Arg Phe Asp Leu Gln His
165 170 175
Leu Glu Asn Pro Glu Ile Ser Gly Ile Glu Tyr Gln Gln Gly Thr Leu
180 185 190
Ala Gly Tyr Glu Thr Arg Glu Tyr Leu Leu Asn Lys Trp Asn Arg Ala
195 200 205
Cys Ala Tyr Cys Gly Ala Lys Gln Ile Pro Leu Gln Ile Asp His Ile
210 215 220
His Pro Arg Ala Arg Gly Gly Ser Asp Arg Val Ser Asn Leu Thr Leu
225 230 235 240

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

290 295 300
Gly Gly Gln Thr Lys Phe Asn Arg Ala Arg Leu Glu Ile Pro Lys Thr
305 310 315 320
His Ala Leu Asp Ala Ala Cys Val Gly Thr Met Glu Ala Ile Arg Asp
325 330 335
Trp Asn Arg Pro Thr Leu Leu Ile Lys Ala Thr Gly Arg Gly Ser Tyr
340 345 350
Gln Arg Thr Arg Leu Asn Ala Tyr Gly Phe Pro Arg Gly Tyr Leu Thr

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

420 425 430
Tyr Gly Tyr Ser Gln Gln Leu Asn Pro Lys Glu Ala Glu Leu Arg Ser
435 440 445
Ala Arg Tyr Pro Ser Pro Ala
450 455
<210> 327
<211> 227
<212> PRT
<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-279 effector

<400> 327

Met Ala Val Phe Val Val Asp Arg Arg Gln Ala Pro Leu Met Pro Cys

1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Ala Gln Gly Arg Ala Arg Val

20 25 30

His Arg Leu Ile Pro Phe Thr Ile Arg Leu Ile Asp Arg Glu Val Val

35 40 45

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

50 55 60

Thr Ser Gly Leu Ala Leu Val Arg Asn Asn Asn Thr Val Asn Ala Glu

65 70 75 80

Thr Gly Lys Ile Thr Ala Thr Ala His Val Leu Asn Leu Phe Glu Leu

85 90 95

Thr His Arg Gly Phe Gln Ile Ser His Thr Leu Thr Ala Arg Arg Gln

100 105 110

Met Arg Arg Arg Arg Arg Ser Ala Asn Leu Arg Tyr Arg Ala Pro Arg

115 120 125

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

130 135 140

Gln His Arg Ile Asp Thr Thr Leu Ser Trp Val Val Arg Leu Arg Asn

145 150 155 160

Val Ala Pro Ser Thr His Leu Ala Gln Glu Leu Val Arg Phe Asp Met

165 170 175

Gln Gln Leu Glu Asn Pro Glu Ile Ala Gly Val Gln Tyr Gln Gln Gly

180 185 190

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

195 200 205

Arg Gln Cys Ala Tyr Cys Asp Val Ser Asn Val Pro Leu Gln Ile Glu
210 215 220

His Ile His
225

<210> 328

<211> 191

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-280 effector

<400> 328

Met Ala Val Leu Val Leu Asp Arg Glu Asp Arg Leu Leu Met Pro Cys
1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Phe Ala Arg Gly Arg Ala Arg Val
20 25 30

His Arg Val Leu Pro Phe Val Ile Arg Leu Val Asp Arg Arg Ala Asp
35 40 45

Asp Cys Asp Phe Gln Pro Leu Arg Leu Lys Leu Asp Pro Gly Ser Lys
50 55 60

Ile Thr Gly Met Val Leu Val Arg Gln Thr Gly Asn Asp Gly Ile Ala
65 70 75 80

Val Leu Asn Leu Phe Glu Leu Ile His Arg Gly Arg Gln Ile Ser Glu
85 90 95

Ala Leu Thr Ala Arg Arg Asn Met Arg Arg Arg Arg Arg Ala Asn Leu
100 105 110

Arg Tyr Arg Ala Pro Arg Phe Leu Asn Arg Arg Met Pro Ala Gly Trp
115 120 125

Leu Pro Pro Ser Leu Gln His Leu Val Asp Thr Thr Met Ala Trp Ile
130 135 140

Arg Arg Leu Tyr Arg Trp Ala Pro Ile Ser Ala Leu Ser Thr Glu Leu

145 150 155 160

Val Gln Phe Asp Met Gln Ala Met Glu Asp Pro Asp Ile Glu Gly Val

165 170 175

Glu Tyr Gln Gln Gly Ala Leu Ala Ala Tyr Glu Leu Arg Glu Tyr

180 185 190

<210> 329

<211> 436

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220

><223> Category: MG35 effectors

<220><223> Description: MG35-281 effector

<400> 329

Met Ala Val Tyr Val Leu Asp Lys Ser Gly Lys Pro Leu Met Pro Cys

1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Val Arg Gly Arg Ala Arg Val

20 25 30

His Arg Leu Met Pro Phe Ala Ile Arg Leu Thr Asp Arg Lys Gln Ala

35 40 45

Glu Ser Leu Leu Gln Pro Leu Ala Ile Lys Val Asp Pro Gly Ser Arg

50 55 60

Tyr Thr Gly Met Ala Leu Val Arg Gln Gln Ala Lys Cys Val Ser Val

65 70 75 80

Leu Ser Leu Met Glu Leu Ala His Arg Gly Ala Ala Ile Arg Lys Ala

85 90 95

Leu Glu Gln Arg Ala Gly Tyr Arg Arg Arg Arg Arg Ser Gln Asn Leu

100 105 110

Arg His Arg Glu Ala Arg Phe Asp Asn Arg Ser Arg Pro Asp Gly Trp

115 120 125

Leu Pro Pro Ser Leu Gln His Arg Val Asp Thr Thr Leu Ser Trp Val

130 135 140

Gln Arg Leu Arg Arg Leu Ala Pro Val Cys Glu Met Ala Ile Glu Arg
145 150 155 160
Val Lys Phe Asp Met Gln Ala Met His Asn Pro Glu Ile Ser Gly Val
165 170 175
Glu Tyr Gln Gln Gly Glu Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu

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

245 250 255
Ala Arg Ile Lys Ala Asn Ala Lys Val Pro Leu Arg Asp Ala Ala Ala
260 265 270
Val Asn Ala Thr Arg Asn Thr Leu Phe Gln Ala Leu Leu Ala Thr Gly
275 280 285
Leu Pro Val Ala Thr Gly Thr Gly Ala Gln Thr Lys Tyr Asn Arg Arg
290 295 300
Arg Leu Gly Ile Pro Lys Thr His Ala Leu Asp Ala Val Cys Val Gly

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

370 375 380
Val His Lys Val Arg Ala Ala Val Arg Lys Ser Gly Ser Phe Asn Val

385 390 395 400

Gln Met Leu Ser Thr Val Ile Gln Gly Ile His His Arg His Cys Arg

405 410 415

Ile Ile Gln Arg Ala Asp Gly Tyr Ser Tyr Ala Gln Ile Ser Thr Gln

420 425 430

Asp Ser Gln Pro

435

<210> 330

<211> 305

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-282 effector

<400> 330

Met Ala Val Tyr Val Leu Asp Lys Ser Gly Met Pro Leu Met Pro Cys

1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Glu Cys Gly Arg Ala Arg Ile

20 25 30

His Arg Gln Leu Pro Phe Val Ile Arg Leu Val Asp Arg Arg Val Asn

35 40 45

Asp Ser Ala Leu Gln Leu Leu Thr Leu Lys Leu Asp Pro Gly Ser Arg

50 55 60

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

65 70 75 80

Leu Ser Leu Leu Glu Met Ile His Arg Gly Ala Ala Ile Arg Gln Ala

85 90 95

Met Gln Gln Arg Ala Ala Phe Arg Arg Arg Arg Arg Ser Ala Asn Leu

100 105 110

Arg Tyr Arg Ala Pro Arg Phe Asp Asn Arg Thr Leu Pro Gln Gly Trp

115 120 125

Leu Pro Pro Ser Leu Arg His Arg Pro Ala Ile Thr Leu Gly Trp Val
130 135 140
Glu Arg Met Arg Asn Trp Thr Pro Ile Ser Cys Leu Ala Val Glu Arg
145 150 155 160
Val Lys Phe Asp Met Gln Ala Met Gln Asn Pro Glu Ile Ser Gly Val

165 170 175
Glu Tyr Gln Gln Gly Glu Leu Ala Gly Tyr Glu Val Arg Glu Ile Glu
180 185 190
His Ile Val Ala Arg Ser Asn Gly Gly Ser Asp Arg Val Phe Asn Leu
195 200 205
Thr Leu Ala Cys Arg Pro Cys Asn Gln Arg Lys Gly Asn Gln Pro Val
210 215 220
Glu Val Phe Leu Lys Arg Asp Pro Asp Arg Leu Ser Arg Ile Lys Ala

225 230 235 240
Arg Ala Lys Ala Pro Leu Arg Asp Ala Ala Glu Ile Asn Ala Thr Arg
245 250 255
Asn Ala Leu Phe Val Asp Met Leu Asn Thr Gly Leu Pro Val Ser Thr
260 265 270
Gly Thr Gly Ala Gln Thr Lys Tyr Asn Arg Gln Arg Leu Gly Val Pro
275 280 285
Lys Thr His Ala Leu Asp Ala Ala Cys Val Gly Glu Val Lys Ala Ile

290 295 300
Glu
305
<210> 331
<211> 425
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-283 effector

<400> 331

Met Ala Val Tyr Val Leu Asp Lys Ser Gly Met Pro Leu Met Pro Cys
1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Glu Cys Gly Arg Ala Arg Ile
20 25 30

His Arg Gln Leu Pro Phe Val Ile Arg Leu Val Asp Arg Arg Val Asn
35 40 45

Asp Ser Ala Leu Gln Leu Leu Thr Leu Lys Leu Asp Pro Gly Ser Arg
50 55 60

Ile Thr Gly Leu Ala Leu Ile Arg Glu Gln Gly Gln Arg Val Ser Val
65 70 75 80

Leu Ser Leu Leu Glu Met Ile His Arg Gly Ala Ala Ile Arg Gln Ala
85 90 95

Met Gln Gln Arg Ala Ala Phe Arg Arg Arg Arg Arg Ser Ala Asn Leu
100 105 110

Arg Tyr Arg Ala Pro Arg Phe Asp Asn Arg Thr Leu Pro Gln Gly Trp
115 120 125

Leu Pro Pro Ser Leu Arg His Arg Pro Ala Ile Thr Leu Gly Trp Val
130 135 140

Glu Arg Met Arg Asn Trp Thr Pro Ile Ser Cys Leu Ala Val Glu Arg
145 150 155 160

Val Lys Phe Asp Met Gln Ala Met Gln Asn Pro Glu Ile Ser Gly Val
165 170 175

Glu Tyr Gln Gln Gly Glu Leu Ala Gly Tyr Glu Val Arg Glu Ile Glu
180 185 190

His Ile Val Ala Arg Ser Asn Gly Gly Ser Asp Arg Val Phe Asn Leu
195 200 205

Thr Leu Ala Cys Arg Pro Cys Asn Gln Arg Lys Gly Asn Gln Pro Val
210 215 220

Glu Val Phe Leu Lys Arg Asp Pro Asp Arg Leu Ser Arg Ile Lys Ala
225 230 235 240

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

Lys Thr His Ala Leu Asp Ala Ala Cys Val Gly Glu Val Lys Ala Ile
290 295 300
Glu His Trp Gln Arg Pro Thr Leu Ala Ile Lys Ala Thr Gly Arg Gly
305 310 315 320
Gly Tyr Gln Arg Thr Arg Leu Thr Ala His Gly Phe Pro Leu Gly Cys
325 330 335
Leu Thr Arg Gln Lys Arg His Leu Gly Phe Gln Thr Gly Asp Gln Val
340 345 350

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

Lys Glu Ala Ala Arg Ala Gly Ala Arg
420 425

<210> 332
<211> 447
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-284 effector

<400> 332

Met Ala Val Tyr Val Leu Asp Asn Thr Gly Lys Pro Leu Met Pro Cys
1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Arg Val
20 25 30

His Arg Leu Ala Pro Leu Val Ile Arg Leu Val Asp Arg Arg Leu Ala
35 40 45

Asp Ser Ala Val Gln Pro Leu Thr Leu Lys Leu Asp Pro Gly Ser Arg
50 55 60

Phe Thr Gly Met Ala Leu Val Arg Glu Arg Gln Lys Arg Val Ser Val
65 70 75 80

Leu Ser Leu Leu Glu Leu Val His Arg Gly Ala Ala Ile Arg Lys Ala
85 90 95

Leu Glu Gln Arg Ala Gly Phe Arg Arg Arg Arg Arg Ser Gln Asn Leu
100 105 110

Arg His Arg Ala Pro Arg Phe Asn Asn Arg Thr Arg Pro Ala Gly Trp
115 120 125

Leu Ala Pro Ser Leu Arg His Arg Leu Asp Thr Thr Leu Ser Trp Val
130 135 140

Ala Arg Ile Arg Arg Trp Ala Pro Ile Thr Ala Leu Ala Val Glu Arg
145 150 155 160

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

Glu Tyr Gln Gln Gly Glu Leu Ala Gly Tyr Thr Val Arg Glu Tyr Leu
180 185 190

Leu Glu Lys Trp Ser Arg Arg Cys Ala Tyr Cys Ala Ala Glu Asn Val
195 200 205

Pro Leu Glu Ile Glu His Ile Ile Pro Arg Ser Asn Gly Gly Ser Asp
210 215 220

Arg Val Ser Asn Leu Thr Leu Ala Cys Arg Pro Cys Asn Gln Arg Lys
225 230 235 240

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

Leu Pro Val Ala Thr Gly Ser Gly Ala Gln Thr Lys Tyr Asn Arg Arg
290 295 300
Arg Leu Gly Ile Pro Lys Thr His Ala Leu Asp Ala Val Cys Val Gly
305 310 315 320
Glu Val Glu Ala Val Ser Gly Trp Gln Arg Pro Thr Leu Ser Ile Lys
325 330 335
Ala Thr Gly Arg Gly Glu Tyr Gln Arg Thr Arg Leu Thr Ala His Gly
340 345 350

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

Leu Ile Gln Arg Ala Asp Gly Tyr Ala Tyr Ala Gln Asn Pro Thr Leu
420 425 430
Asp Ser Ala Gln Pro Gln Gln Glu Ala Ala Arg Thr Gly Ala Arg
435 440 445

<210> 333
<211> 322
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-285 effector

<400> 333

Met Ala Trp Val Ser Arg Ile Gln Arg Leu Ala Pro Val Ser Ala Ile

1 5 10 15

Ser Thr Glu Leu Val Arg Phe Asp Met Gln Ala Met Glu Asn Pro Glu

20 25 30

Ile Glu Gly Ala Gln Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val

35 40 45

Arg Glu Tyr Leu Leu Glu Lys Trp Asp Arg Thr Cys Ala Tyr Cys Gly

50 55 60

Ala Lys Asp Val Pro Leu Gln Ile Glu His Ile His Pro Lys Ser Lys

65 70 75 80

Asn Gly Ser Asp Arg Ile Asn Asn Leu Ala Leu Ala Cys Gln Cys Cys

85 90 95

Asn Gln Lys Lys Ala Ala Leu Pro Val Glu Met Phe Leu Ala Lys Lys

100 105 110

Pro Lys Leu Leu Lys Arg Ile Leu Ala Gln Ala Lys Arg Pro Leu Lys

115 120 125

Asp Ala Ala Ala Val Asn Ser Thr Arg Trp Ala Leu Val Asn Thr Leu

130 135 140

Lys Thr Thr Gly Leu Val Val Glu Thr Ala Ser Gly Gly Gln Thr Lys

145 150 155 160

Phe Asn Arg Asn Gln Leu Gly Ile Pro Lys Thr His Ala Leu Asp Ala

165 170 175

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

180 185 190

Leu Ala Ile Lys Ala Met Gly Arg Gly Ser Tyr Gln Arg Thr Arg Leu

195 200 205

Asp Lys Phe Gly Cys Val Arg Gly Tyr Leu Thr Arg Ser Lys Ser Ser

210 215 220

Thr Gly Phe Gln Thr Gly Asp Met Val Lys Ala Glu Val Thr Thr Gly
225 230 235 240
Lys Lys Ile Gly Ser Tyr Thr Gly Arg Val Ala Ile Arg Ala Thr Gly
245 250 255
Ser Phe Asn Ile Gln Thr Ser Thr Gly Leu Val Gln Gly Val Ser His

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

<210> 334
<211> 489
<212
> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-286 effector
<400> 334
Met Asp Met Val Tyr Val Leu Asn Lys Asp Gly Lys Pro Leu Met Ala
1 5 10 15
Thr Thr Arg Gly Gly Arg Val Arg Tyr Leu Leu Lys Glu Lys Lys Ala
20 25 30
Arg Val Val Cys Thr Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr

35 40 45
Pro Asp Ile Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr
50 55 60
Asn Ile Gly Val Ala Ala Val Lys Glu Asp Gly Gln Cys Val Phe Ser

65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Asp Val Pro Leu Leu Met Glu Lys

85 90 95

Arg Ala Ala Phe Arg Arg Asn His Arg Asn Leu Asp Arg Arg Arg Lys

100 105 110

Arg Gln Arg Arg Ala Lys Ala Ala Gly Thr Ile Val Glu Asn Glu Thr

115 120 125

Ile Glu Arg Leu Leu Pro Gly Tyr Glu Lys Pro Val Val Cys His Tyr

130 135 140

Val Arg Asn Lys Glu Ala Arg Phe Asn Asn Arg Cys Arg Pro Gln Gly

145 150 155 160

Trp Leu Thr Pro Thr Ala Asn His Leu Leu Gln Thr His Ile Asn Leu

165 170 175

Ile Ala Lys Ile Ala Lys Leu Leu Pro Val Thr Lys Val Val Val Glu

180 185 190

Leu Asn Arg Phe Ala Phe Met Ala Met Asp Asn Pro Asn Ile Arg Arg

195 200 205

Trp Glu Tyr Gln Gln Gly Pro Leu Tyr Gly Leu Gly Ser Val Glu Asp

210 215 220

Ala Val Tyr Ala Gln Gln Asp Gly His Cys Leu Phe Cys Lys Lys Pro

225 230 235 240

Ile Asp His Tyr His His Val Val Pro Arg Asn Lys Asn Gly Ser Glu

245 250 255

Thr Leu Ala Asn Arg Cys Gly Leu Cys Ala Lys His His Asp Leu Val

260 265 270

His Lys Asp Lys Ala Trp Thr Asp Lys Leu Val Thr Arg Lys Glu Gly

275 280 285

Met Asn Lys Lys Tyr His Ala Leu Ser Val Leu Asn Gln Ile Ile Pro

290 295 300

His Leu Met Glu Tyr Leu Gly Ser Lys Thr Leu Tyr Asp Val Tyr Ala

305 310 315 320

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

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

420 425 430
Lys Asp Met Thr Arg Ile Met Pro Gly Ala Val Met Asp Phe Asn Gly
435 440 445
Thr Ile Gly Val Met Gln Ser Ser Thr Val Gly Ser Phe Tyr Lys Ser
450 455 460
Thr Glu Gly His Lys Ser Thr Pro Arg Lys Cys Val Leu Leu Met Arg
465 470 475 480
Asn Ala Gly Met Val Phe Ile Pro Ala
485

<210> 335
<211> 489
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-287 effector
<400> 335
Met Asp Met Val Tyr Val Leu Asn Lys Asp Gly Lys Pro Leu Met Ala

1 5 10 15

Thr Thr Arg Gly Gly Arg Val Arg Tyr Leu Leu Lys Glu Lys Lys Ala

20 25 30

Arg Val Val Ser Ser Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr

35 40 45

Pro Asp Ile Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr

50 55 60

Asn Ile Gly Val Ala Val Val Lys Glu Asp Gly Gln Cys Val Phe Ser

65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Glu Val Pro Leu Leu Met Lys Lys

85 90 95

Arg Ala Ala Phe Arg Arg Gln His Arg Thr Gln Asp Arg Arg Arg Lys

100 105 110

Arg Gln Arg Arg Ala Ile Ala Ala Gly Thr Thr Val Glu Ser Asn Thr

115 120 125

Ile Glu Arg Leu Leu Pro Gly Tyr Glu Lys Pro Ile Val Cys His His

130 135 140

Ile Arg Asn Lys Glu Ala Arg Phe Asn Asn Arg Ser Arg Pro Ala Gly

145 150 155 160

Trp Leu Thr Pro Thr Ala Asn His Leu Leu Gln Thr His Ile Asn Leu

165 170 175

Ile Ala Lys Ile Ala Lys Val Leu Pro Ile Thr Lys Val Val Val Glu

180 185 190

Leu Asn Arg Phe Ala Phe Met Ala Met Asp Asn Pro Asn Ile Arg Arg

195 200 205

Trp Glu Tyr Gln Gln Gly Ser Leu Tyr Gly Leu Gly Ser Val Glu Asp

210 215 220

Ala Val Tyr Ala Gln Gln Asp Gly His Cys Leu Phe Cys Lys Lys Pro

225 230 235 240

Ile Asp His Tyr His His Val Val Pro Arg His Lys Gly Gly Ser Glu

245 250 255

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

290 295 300
Phe Leu Met Glu Tyr Leu Gly Glu Glu Thr Pro Tyr Asp Val Tyr Ala
305 310 315 320
Thr Asp Gly Lys Ser Thr Lys Gly Phe Arg Ile Ala Lys Asn Val Pro
325 330 335
Lys Glu His Tyr Thr Asp Ala Tyr Cys Ile Ala Cys Ser Ile Leu Asp
340 345 350
Ala Asp Thr Lys Val Ser Ala Pro Ala Glu Pro Phe Lys Leu Lys Gln

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

420 425 430
Lys Asp Met Thr Arg Ile Met Pro Gly Ala Val Met Ala Phe Asn Gly
435 440 445
Ser Val Gly Val Met Gln Ser Ser Ile Val Gly Ser Phe Tyr Lys Ser
450 455 460
Thr Lys Gly His Lys Ala Thr Pro Arg Arg Cys Val Leu Leu Ala Gln
465 470 475 480
Asn Ala Gly Met Val Phe Asn Pro Ala
485

<210> 336

<211> 289

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-288 effector

<400> 336

Met Glu Asp Ser Thr Leu Gln Pro Val Arg Leu Lys Leu Asp Pro Gly
1 5 10 15

Ser Lys Thr Thr Gly Met Ala Leu Val Arg Glu Ser Glu Glu Val Tyr
20 25 30

Pro Asp Thr Gly Glu Val Gln Arg Thr Ala His Val Leu Lys Leu Ala
35 40 45

Asp Leu Gln His Arg Gly His Val Ile Arg Glu Ala Leu Thr Gln Arg
50 55 60

Ala Ser Phe Arg Arg Arg Arg Arg Gly Ala Asn Leu Arg His Arg Ala
65 70 75 80

Pro Arg Phe Cys Asn Arg Thr Arg Pro Ala Gly Trp Leu Ala Pro Ser
85 90 95

Leu Gln His Arg Ala Asp Thr Thr Leu Ala Trp Val Arg Arg Leu Gln
100 105 110

Arg Trp Ser Pro Ile Thr Ala Leu Ser Gln Glu Leu Val Arg Phe Asp
115 120 125

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

Gly Thr Leu Gln Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys Trp
145 150 155 160

His Arg Thr Cys Ala Tyr Cys Pro Ala Thr Asn Val Pro Leu Gln Val
165 170 175

Glu His Ile Val Pro Arg Ala Lys Gly Gly Ser His Arg Val Ser Asn
180 185 190

Leu Thr Leu Ala Cys Gly Pro Cys Asn Thr Ala Lys Gly Thr Gln Asp
195 200 205
Val Arg Ala Phe Leu Ala Gln Asp Pro Lys Arg Leu Ala Arg Val Leu
210 215 220
Ala Gln Ala Lys Ala Pro Leu Arg Asp Ala Ala Ala Met Lys Leu Phe

225 230 235 240
Thr Gln Ala Glu Phe Asp Asn Leu Pro Val Ile Asp Gly Val Lys Gln
245 250 255
Cys Pro Thr Gly Asp Tyr Ser Ser Val Arg Asn Phe Gly Glu Arg Cys
260 265 270
Val Phe Gly Ala Glu Ser Ile Phe Cys Arg Asp Ser Arg Phe Ala Asp
275 280 285
Ser

<210> 337
<211> 257
<212> PRT

<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-289 effector
<400> 337
Met Glu Asn Ala Asp Ile Ser Gly Val Glu Tyr Gln Gln Gly Glu Leu
1 5 10 15
Gln Gly Tyr Glu Val Arg Gln Tyr Val Leu Glu Arg Gly Gly His Thr
20 25 30
Cys Ser Tyr Cys Asp Ala Lys Asp Val Ala Leu His Leu Asp His Val
35 40 45

Leu Pro Arg Ser Arg Gly Gly Ser Asn Arg Val Ser Asn Leu Val Pro
50 55 60
Ala Cys Lys Pro Cys Asn Asp Ala Lys Ser Asn Arg Ala Val Glu Asp

65 70 75 80

Tyr Leu Val Asp Arg Pro Glu Val Leu Arg Gln Val Lys Ala Gln Leu

85 90 95

Arg Ser Pro Leu Lys Asp Ala Ala Val Met Asn Ala Thr Arg Phe Ala

100 105 110

Ile Val Asp Ala Leu Arg Asp Phe Gly Leu Glu Val Gln Met Trp Ser

115 120 125

Gly Gly Arg Thr Lys Trp Asn Arg Thr Asn Leu Gly Leu Pro Lys Asp

130 135 140

His Trp Ile Asp Ala Ala Cys Val Gly Glu Thr Gly Ala Ala Val Arg

145 150 155 160

Val Pro Ala Leu Arg Pro Leu Thr Ile Thr Ala Met Gly Arg Gly His

165 170 175

Arg Arg Val His Gly Asn Asp Arg Tyr Gly Phe Pro Arg Gly Thr Ala

180 185 190

Arg Arg Ala Lys Arg Val Ala Gly Phe Gln Thr Gly Asp Leu Val Arg

195 200 205

Leu Val Cys Leu Gly Gly Lys Ser Ala Gly Ile His Thr Gly Arg Leu

210 215 220

Ser Ser Ile Arg Thr Arg Gly Gln Phe Val Leu Gly Lys His Asp Arg

225 230 235 240

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

245 250 255

Gly

<210> 338

<211> 54

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-290 effector

<400> 338

Met Gly Arg Val Ala Val Arg Ala Ser Gly Ser Phe Asn Ile Gln Thr
1 5 10 15
Gly Asn Gly Leu Val Gln Gly Val Ser His Arg Tyr Cys Thr Val Val

20 25 30
Gln Arg Gly Asn Gly Tyr Gly Tyr Ser Leu Val Ala Lys Thr Asp Val
35 40 45
Arg Gly Thr Pro Pro Gln
50

<210> 339

<211> 187

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-291 effector

<400> 339

Met Gly Tyr His Asp Tyr Pro Ile Leu Thr Gly Ile Leu Phe Ile Arg

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

65 70 75 80
Val Thr Asp Gly Thr Gly Gly Gln Thr Lys Phe Asn Arg Asn Arg Leu
85 90 95
Gly Leu Pro Lys Ser His Trp Leu Asp Ala Ala Cys Val Gly Asn Val

100 105 110

Glu Thr Leu Lys Val Leu Thr Ser Lys Pro Leu Leu Ile Ala Ala Lys

115 120 125

Gly His Gly Thr Arg Gln Met Cys Gly Thr Asn Lys Tyr Gly Phe Pro

130 135 140

Thr Arg His Lys Ser Arg Val Gln Ile His Lys Gly Phe Arg Thr Gly

145 150 155 160

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

165 170 175

Val Gly Arg Val Leu Cys Arg Ala Ser Gly Ser

180 185

<210> 340

<211> 173

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-292 effector

<400> 340

Met Ile Pro Val Glu Pro Lys Asn Thr Pro Thr Asp Ala Ser Pro Val

1 5 10 15

Cys Ser Ser Val Thr Asp Ala Leu Asn Ser Thr Ser Arg Asp Leu Arg

20 25 30

Gln Cys Ala Pro Glu Val Leu Ala Gly Ile Phe Val Glu Glu Thr Val

35 40 45

Arg Arg Lys Ala Ser Gly Glu Ser Gln Ile Phe Val Leu Asp Asn Arg

50 55 60

Arg Ile Pro Leu Met Pro Cys Arg Pro Ala Arg Ala Trp Arg Leu Leu

65 70 75 80

Lys Ala Gly Lys Ala Ser Val Phe Arg Arg Phe Pro Phe Thr Ile Ile

85 90 95

Leu Lys Arg Asp Val Asp Pro Asp Pro Gln Pro Val Glu Phe Lys Val
100 105 110

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

<210> 341

<211> 482
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-293 effector
<400> 341
Met Ile Pro Val Glu Pro Lys Asn Thr Pro Thr Asp Ala Ser Pro Val
1 5 10 15
Cys Ser Ser Val Thr Asp Ala Leu Asn Ser Thr Ser Arg Asp Leu Arg
20 25 30
Gln Cys Ala Pro Glu Val Leu Ala Gly Ile Phe Val Glu Glu Thr Val

35 40 45
Arg Arg Lys Ala Ser Gly Glu Ser Gln Ile Phe Val Leu Asp Asn Arg
50 55 60
Arg Ile Pro Leu Met Pro Cys Arg Pro Ala Arg Ala Trp Arg Leu Leu
65 70 75 80
Lys Ala Gly Lys Ala Ser Val Phe Arg Arg Phe Pro Phe Thr Ile Ile
85 90 95

Leu Lys Arg Asp Val Asp Pro Asp Pro Gln Pro Val Glu Phe Lys Val

100 105 110

Asp Pro Gly Ser Arg Thr Thr Gly Ile Ala Leu Val Ala Leu Phe Pro

115 120 125

Asn Arg Gly Arg Val Val Leu Trp Ala Ala Asn Leu His His Arg Gly

130 135 140

Leu Lys Ile Lys Ser Ala Ile Asp Arg Arg Arg Ala Leu Arg Arg Gly

145 150 155 160

Arg Arg Ala Arg Asn Thr Arg Tyr Arg Ala Ala Arg Phe Asp Asn Arg

165 170 175

Val Arg Ala Lys Gly Trp Leu Pro Pro Ser Ile Gln Ser Arg Val Asp

180 185 190

Asn Val His Ser Trp Tyr Leu Lys Leu Leu Ala Arg Val Pro Ile Ser

195 200 205

Glu Ala His Ile Glu Thr Val Arg Phe Asp Met Gln Lys Ile Gln Asn

210 215 220

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

225 230 235 240

Glu Ile Arg Glu Tyr Leu Leu Glu Lys Phe Ser Arg Arg Cys Ala Tyr

245 250 255

Cys Gly Ala Lys Asp Val Gln Leu Gln Ile Glu His Ile Lys Pro Lys

260 265 270

Ala Leu Gly Gly Thr Asn Arg Val Ser Asn Leu Thr Leu Ala Cys Glu

275 280 285

Pro Cys Asn Leu Arg Lys Gly Lys Met Pro Ile Glu Asp Phe Leu Arg

290 295 300

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

305 310 315 320

Leu Thr Asp Ala Ala Ser Val Asn Ala Ser Arg Tyr Ala Ile Gly Asp

325 330 335

Lys Ile Arg Ser Ile Gly Leu Pro Thr Cys Phe Trp Ser Gly Gly Arg

340 345 350

Thr Lys Lys Asn Arg Val Phe Gln Gly Tyr Ala Lys Asp His Trp Ile

355 360 365

Asp Ala Ala Cys Val Gly Glu Ser Gly Val Ser Val Asn Ile Gly Ser

370 375 380

Val Lys Pro Ile Ser Ile Ser Ala Ile Gly Arg Gly Ser Arg Gln Val

385 390 395 400

Ser Cys Val Asp Lys Tyr Gly Phe Pro Arg Gly Lys Ala Gly Thr Val

405 410 415

Lys Arg Val Phe Gly Phe Ser Thr Gly Asp Phe Val Arg Leu Thr Arg

420 425 430

Leu Ser Gly Lys Tyr Ala Gly Val Trp Val Gly Ile Ile Ala Gly Thr

435 440 445

Arg Lys Ser Gly Tyr Leu Asp Ile Lys Cys Gly Lys Lys Lys Ile Thr

450 455 460

Ala Lys His Ser Glu Phe Arg Leu Leu Asn His Gly Asp Gly Tyr Val

465 470 475 480

Tyr Ala

<210> 342

<211> 110

<212

> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-294 effector

<400> 342

Met Leu Gly Leu His Lys Glu His Trp Leu Asp Ala Ala Cys Val Gly

1 5 10 15

Glu Ser Gly Ala Asn Ile Val Ile Pro Leu Gly Leu Gln Pro Leu Gly

20 25 30

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

35 40 45

Phe Gly Phe Pro Lys Arg His Arg Thr Asn Gln Lys Ser Phe Phe Gly

50 55 60

Phe Gln Thr Gly Asp Met Ala Arg Ala Ser Ile Pro Ser Gly Lys Lys

65 70 75 80

Gln Gly Val His Thr Gly Arg Val Leu Val Arg Ala Thr Gly Ser Phe

85 90 95

Asp Ile His Val Leu Val Lys Asp Phe His Pro Gly Asn Leu

100 105 110

<210> 343

<211> 125

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-295 effector

<400> 343

Met Leu Gly Leu His Lys Glu His Trp Leu Asp Ala Ala Cys Val Gly

1 5 10 15

Glu Ser Gly Ala Asn Ile Val Ile Pro Leu Gly Leu Gln Pro Leu Gly

20 25 30

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

35 40 45

Phe Gly Phe Pro Lys Thr His Arg Thr Asn Gln Lys Ser Tyr Tyr Gly

50 55 60

Phe Gln Thr Gly Asp Met Ala Arg Ala Ser Ile Pro Ser Gly Lys Lys

65 70 75 80

Gln Gly Val His Thr Gly Arg Val Leu Val Arg Ala Thr Gly Ser Phe

85 90 95

Asp Ile Gln Thr Lys Ala Gly Arg Val Ala Gly Ile Ser His Lys His
100 105 110
Cys Val Ala Val His Arg Lys Asp Gly Tyr Thr Tyr Gln
115 120 125
<210> 344
<211> 476
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-296 effector
<400> 344
Met Leu His Gln Pro Gln Ala Leu Ser Pro Thr Thr Lys Lys Arg Ala

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

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

130 135 140
Val Lys Ala Ser Met Thr Asp Arg Ala Met Phe Arg Arg Gly Arg Arg

145 150 155 160

Gly Arg Lys Thr Arg Tyr Arg Ala Ala Arg Phe Glu Asn Arg Thr Arg

165 170 175

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

180 185 190

Lys Asn Trp Tyr Ser Arg Leu Leu Ser Arg Ala Ser Ile Ser Val Ala

195 200 205

Gln Val Glu Thr Ser Ser Phe Asp Thr Gln Leu Met Glu Asn Ala Asp

210 215 220

Ile Ser Gly Val Glu Tyr Gln Gln Gly Glu Leu Gln Gly Tyr Glu Val

225 230 235 240

Arg Gln Tyr Val Leu Glu Arg Gly Gly His Thr Cys Ser Tyr Cys Asp

245 250 255

Ala Lys Asp Val Ala Leu His Leu Asp His Val Leu Pro Arg Ser Arg

260 265 270

Gly Gly Ser Asn Arg Val Ser Asn Leu Val Pro Ala Cys Lys Pro Cys

275 280 285

Asn Asp Ala Lys Ser Asn Arg Ala Val Glu Asp Tyr Leu Val Asp Arg

290 295 300

Pro Glu Val Leu Arg Gln Val Lys Ala Gln Leu Arg Ser Pro Leu Lys

305 310 315 320

Asp Ala Ala Val Met Asn Ala Thr Arg Phe Ala Ile Val Asp Ala Leu

325 330 335

Arg Asp Phe Gly Leu Glu Val Gln Met Trp Ser Gly Gly Arg Thr Lys

340 345 350

Trp Asn Arg Thr Asn Leu Gly Leu Pro Lys Asp His Trp Ile Asp Ala

355 360 365

Ala Cys Val Gly Glu Thr Gly Ala Ala Val Arg Val Pro Ala Leu Arg

370 375 380

Pro Leu Thr Ile Thr Ala Met Gly Arg Gly His Arg Arg Val His Gly

385 390 395 400

Asn Asp Arg Tyr Gly Phe Pro Arg Gly Thr Ala Arg Arg Ala Lys Arg
405 410 415
Val Ala Gly Phe Gln Thr Gly Asp Leu Val Arg Leu Val Cys Leu Gly
420 425 430
Gly Lys Ser Ala Gly Ile His Thr Gly Arg Leu Ser Ser Ile Arg Thr
435 440 445
Arg Gly Gln Phe Val Leu Gly Lys His Asp Arg Pro Ala Arg Glu Phe

450 455 460
Thr Leu Leu Gln Arg Ser Asp Gly Tyr Ala Tyr Gly
465 470 475
<210> 345
<211> 69
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-297 effector
<400> 345
Met Leu Lys Leu Leu Arg Leu Ala Pro Leu Thr Gln Ile Ala Val Glu
1 5 10 15

Thr Val Arg Phe Asp Thr Gln Lys Met Gln Lys Pro Glu Ile Ser Gly
20 25 30
Val Glu Tyr Gln Gln Gly Glu Leu Ala Gly Tyr Glu Leu Arg Ala Tyr
35 40 45
Leu Leu Glu Lys Val Asn Ala Leu Ile Val Val Pro Lys Met Tyr Arg
50 55 60
Leu Lys Leu Ser Thr
65
<210> 346
<211> 275
<212> PRT
<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-298 effector

<400> 346

Met Leu Lys Pro Asn Phe Val Phe Val Leu Asp Ala Ser Lys Lys Pro
1 5 10 15

Leu Thr Pro Cys Lys Pro Ser Met Ala Arg Arg Leu Leu Gly Leu Gly
20 25 30

Lys Ala Ala Ile Phe His Arg Tyr Pro Phe Thr Ile Ile Leu Lys Lys
35 40 45

Glu Val Glu Ser Thr Pro Glu Pro Ile Thr Leu Lys Ile Asp Pro Gly
50 55 60

Ser Lys Thr Thr Gly Phe Ala Leu Leu Asn Ser Asn Lys Val Val Tyr
65 70 75 80

Gly Ala Glu Leu Thr His Arg Gly Thr Val Ile Lys Leu Ser Leu Glu
85 90 95

Leu Arg Arg Asn Leu Arg Arg Gly Arg Arg Asn Arg His Thr Arg Tyr
100 105 110

Arg Gln Ala Arg Phe Leu Asn Arg Lys Arg Pro Glu Gly Trp Leu Ala
115 120 125

Pro Ser Leu Gln His Arg Val Glu Thr Thr Leu Thr Trp Val Glu Lys
130 135 140

Phe Arg Lys Tyr Ala Pro Ile Gly Asn Ile Val Gln Glu Leu Val Arg
145 150 155 160

Phe Asp Leu Gln Gln Met Glu Asn Pro Glu Ile Ser Trp Ile Glu Tyr
165 170 175

Gln Gln Gly His Leu Gln Gly Tyr Glu Val Arg Glu Tyr Leu Leu Asn
180 185 190

Lys Trp Glu Arg Lys Cys Ala Tyr Cys Ser Val Glu Asn Val Pro Leu
195 200 205

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

Gln Asp Ile Glu Val Phe Leu Lys Lys Lys Pro Glu Val Leu Lys Thr
245 250 255
Ile Lys Ala Gln Ala Lys Arg Pro Leu Lys Asp Ala Ala Ala Val Asn
260 265 270
Ser Thr Arg
275

<210> 347
<211> 425
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-299 effector
<400> 347
Met Leu Lys Pro Asn Phe Val Phe Val Leu Asp Ala Ser Lys Lys Pro

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

65 70 75 80
Gly Ala Glu Leu Thr His Arg Gly Thr Val Ile Lys Leu Ser Leu Glu
85 90 95
Leu Arg Arg Asn Leu Arg Arg Gly Arg Arg Asn Arg His Thr Arg Tyr

100 105 110

Arg Gln Ala Arg Phe Leu Asn Arg Lys Arg Pro Glu Gly Trp Leu Ala

115 120 125

Pro Ser Leu Gln His Arg Val Glu Thr Thr Leu Thr Trp Val Glu Lys

130 135 140

Phe Arg Lys Tyr Ala Pro Ile Gly Asn Ile Val Gln Glu Leu Val Arg

145 150 155 160

Phe Asp Leu Gln Gln Met Glu Asn Pro Glu Ile Ser Trp Ile Glu Tyr

165 170 175

Gln Gln Gly His Leu Gln Gly Tyr Glu Val Arg Glu Tyr Leu Leu Asn

180 185 190

Lys Trp Glu Arg Lys Cys Ala Tyr Cys Ser Val Glu Asn Val Pro Leu

195 200 205

Gln Val Glu His Ile His Pro Lys Ala Glu Gly Gly Ser Asn Arg Ser

210 215 220

Ser Asn Leu Cys Leu Ala Cys Glu Lys Cys Asn Leu Lys Lys Gly Thr

225 230 235 240

Gln Asp Ile Glu Val Phe Leu Lys Lys Lys Pro Glu Val Leu Lys Thr

245 250 255

Ile Lys Ala Gln Ala Lys Arg Pro Leu Lys Asp Ala Ala Ala Val Asn

260 265 270

Ser Thr Arg Trp Glu Leu Phe Arg Arg Leu Glu Lys Thr Gly Leu Pro

275 280 285

Val Ser Val Gly Ser Gly Gly Leu Thr Lys Phe Asn Arg Thr Arg Leu

290 295 300

Glu Leu Pro Lys Thr His Trp Leu Asp Ala Ala Cys Val Gly Glu Ile

305 310 315 320

Glu Ser Leu Lys Val Leu Thr Asp Lys Pro Leu Leu Ile Lys Cys Asn

325 330 335

Gly His Gly Thr Arg Gln Met Tyr Arg Thr Asp Lys Tyr Gly Phe Pro

340 345 350

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

385 390 395 400
Lys Ser Gly Leu Ile Gln Gly Met Asn His Lys Asn Phe Arg Thr Ile
405 410 415
Tyr Lys Lys Asp Gly Tyr Ser Tyr Ala
420 425
<210> 348
<211> 252
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-300 effector
<400> 348
Met Leu Leu Ser Gln Arg Lys Ala Ala Val Phe Arg Pro Tyr Pro Tyr

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

65 70 75 80
Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg Lys Pro Arg Gly Leu Asn
85 90 95
Arg Thr Arg Asn Thr Gly Trp Leu Pro Pro Ser Leu Asn Ser Arg Val

100 105 110

Ala Asn Ile Leu Thr Trp Val Lys Arg Leu Ser Leu Leu Cys Gln Ile

115 120 125

Asn Ala Ile Ser Gln Glu Leu Val Arg Phe Asp Thr Gln Gln Met Ala

130 135 140

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

145 150 155 160

Tyr Glu Val Arg Glu Phe Leu Leu Phe Lys Trp Asp Arg Thr Cys Ala

165 170 175

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

180 185 190

Arg Ser Lys Gly Gly Ser Asn Arg Val Ser Asn Leu Cys Leu Ala Cys

195 200 205

Val Pro Cys Asn Arg Glu Lys Gly Asn Gln Asp Ile Lys Asp Phe Leu

210 215 220

Lys Gly Lys Pro Asp Leu Leu Lys Gln Ile Leu Ala Gln Ala Lys Arg

225 230 235 240

Pro Leu Ala Asn Ala Ala Ala Val Asn Thr Thr Arg

245 250

<210> 349

<211> 197

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-301 effector

<400> 349

Met Leu Asn Gln Ile Ile Pro His Leu Met Glu Tyr Leu Gly Asn Glu

1 5 10 15

Thr Leu Tyr Asp Val Tyr Ala Thr Asp Gly Cys Ser Thr Lys Gly Phe

20 25 30

Arg Ile Ala Lys Asn Val Pro Lys Glu His Tyr Thr Asp Ala Tyr Cys
35 40 45

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

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

Arg Phe Leu Met Arg Ser Cys Val Leu Leu Ala Gln Asn Ala Gly Met
180 185 190
Val Phe Ile Pro Ala
195

<210> 350
<211> 164
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-302 effector
<400> 350
Met Leu Pro Val Glu Ile Gly Ser Gly Gly Leu Thr Lys Phe Asn Arg

1 5 10 15

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

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

Pro Ser Ser Thr Gly Lys Asn Asn Phe Pro Val Ser Ser Arg Leu Leu
145 150 155 160
Thr Gly Arg Leu

<210> 351
<211> 517
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-303 effector
<400> 351
Met Leu Thr Arg Asp Ser Glu Ser Arg His Gly Lys Pro Gly Lys Ala

1 5 10 15

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

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

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

Leu Pro Pro Ser Leu Gln His Arg Val Asp Ala Val Val His Trp Ala
210 215 220
Asp Arg Leu Arg Arg Leu Cys Pro Val Ala Gly Ile Val Met Glu Ala
225 230 235 240
Val Arg Phe Asp Thr Gln Leu Leu Ala Asp Pro Asp Ile Ser Gly Val
245 250 255

Glu Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Ile Arg Glu Trp Val
260 265 270

Leu Glu Lys Trp Gly Arg Ala Cys Val Tyr Cys Gly Ala Glu Gly Val
275 280 285

Pro Leu Gln Leu Asp His Val Val Ala Arg Gly Arg Leu Gly Gln Gly
290 295 300

Arg Pro Lys Asp Phe Val Pro Ser Cys Gly Pro Cys Asn Gln Lys Lys
305 310 315 320

Gly Met Arg Leu Val Glu Glu Phe Leu Ala Lys Lys Pro Ala Leu Leu
325 330 335

Ala Gln Ile Leu Ala Gly Leu Glu Lys Pro Val Arg Asp Ala Ala Ala
340 345 350

Val Asn Ser Thr Arg Val Ala Leu His Arg Ala Leu Ala Ala Thr Gly
355 360 365

Leu Pro Val Arg Thr Gly Ser Gly Gly Arg Thr Lys Trp Asn Arg Ser
370 375 380

Arg Phe Gly Val Pro Lys Thr His Ala Leu Asp Ala Leu Cys Ala Gly
385 390 395 400

Glu Thr Gln Ala Val His Gly Trp Gln Arg Leu Pro Thr Leu Val Ile
405 410 415

Gly Cys Ser Gly Arg Gly Ser His Gln Arg Thr Arg Val Thr Ala Asp
420 425 430

Gly Phe Pro Arg Gly Tyr Leu Met Arg Arg Lys Arg Val Phe Gly Phe
435 440 445

Ala Thr Gly Asp Leu Val Arg Ala Val Val Pro Ala Gly Lys Lys Ala
450 455 460

Gly Thr His Val Gly Arg Val Ala Val Arg Ser Arg Gly Ser Phe Asn
465 470 475 480

Ile Arg Thr Thr Ala Gly Val Ile Asp Ser Val Ser His Lys His Cys
485 490 495

Arg Leu Leu Gln Arg Ala Asp Gly Tyr Asn Tyr Asn Thr Arg Ser Gly

500 505 510

Ala Ser Ser Pro Pro

515

<210> 352

<211> 183

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-304 effector

<400> 352

Met Leu Thr Arg Thr Gly Leu Ala Val Glu Ala Thr Thr Gly Gly Arg
1 5 10 15

Thr Lys Trp Asn Arg Ala Arg Met Gly Ile Pro Lys Arg Asp Ala Trp
20 25 30

Asp Ala Ala Cys Ala Gly Thr Val Asp Gln Ile Leu Gly Trp Asp Arg
35 40 45

Pro Ile Gln Arg Ile Asp Cys Leu Gly Arg Gly Ser His Gln Arg Thr
50 55 60

Arg Val Thr Lys Asp Gly Phe Pro Arg Gly Tyr Leu Pro Arg Thr Lys
65 70 75 80

Thr Val Gln Gly Phe Arg Thr Gly Asp His Val Arg Ala Ile Val Pro
85 90 95

Thr Gly Lys Lys Thr Gly Thr Trp Ala Gly Arg Val Ala Val Arg Thr
100 105 110

Thr Gly Ser Phe Asn Ile Gln Thr Val Ala Glu Thr Val Gln Gly Val
115 120 125

Ser Ala Arg Trp Cys Val Leu Leu Gln Arg Gly Asp Gly Tyr Arg Tyr
130 135 140

Ser Gln Val Gly Ser Glu Pro Leu Leu Ala Val Arg Pro Ser Ser Arg
145 150 155 160

Arg Leu Lys Ala Thr Val Ser Gly Pro Leu Ala Pro Asp Val Thr Thr
165 170 175

His Thr Leu Glu Gly Phe Glu
180

<210> 353
<211> 290
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-305 effector
<400> 353
Met Asn Asn Asn Ser Val Phe Val Leu Asp Thr Asn Lys Lys Pro Cys
1 5 10 15
Asn Pro Val His Pro Ala Val Ala Arg Lys Leu Leu Thr Gln Gly Lys
20 25 30

Ala Ala Val Phe Arg Arg Tyr Pro Phe Thr Ile Val Leu Lys Glu Glu
35 40 45
Ser Lys Asp Glu Val Lys Glu Leu Arg Val Lys Ile Asp Pro Gly Ala
50 55 60
Lys Thr Thr Gly Leu Ala Ile Val Ser Asp Thr Asn Val Val Trp Cys
65 70 75 80
Ala Glu Leu Glu His Arg Gly Phe Gln Val Arg Glu Lys Phe Asn Asp
85 90 95

Arg Arg Thr Leu Arg Arg Ser Arg Gly Asn Arg Lys Thr Arg Tyr Arg
100 105 110
Lys Pro Arg Phe Leu Asn Arg Lys Arg Pro Lys Gly Trp Leu Pro Ser
115 120 125
Ser Leu Met Ser Arg Val Phe Asn Ile Glu Ser Trp Val Lys Lys Leu
130 135 140
Cys Arg Leu Ala Pro Ile Thr Ala Ile Ile Gln Glu Leu Val Arg Leu

145 150 155 160

Asp Thr His Lys Ile Ile Asn Pro Glu Ile Asn Gly Thr Glu Tyr Gln
165 170 175
Lys Gly Glu Leu Phe Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys
180 185 190
Phe Asn Arg Thr Cys Val Tyr Cys Asn Thr Lys Glu Gly Pro Phe Asn
195 200 205
Leu Asp Leu Phe His Pro Lys Ser Lys Gly Gly Ser Asp Arg Val Ser
210 215 220

Asn Leu Val Leu Ile Cys Val Lys Cys Asn Gln Lys Lys Asp Asn Gln
225 230 235 240
Leu Pro Ala Asp Phe Leu Ser Asp Lys Pro Lys Leu Leu Ala Ile Ile
245 250 255
Glu Lys Gln Arg Lys Gln Pro Leu Ala Asp Ala Ala Ala Val Asn Ala
260 265 270
Thr Arg Trp Lys Leu Lys Glu Val Leu Glu Asn Thr Gly Leu Pro Val
275 280 285

Glu Thr
290

<210> 354
<211> 433
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-307 effector
<400> 354
Met Pro Cys His Pro Ala Arg Ala Arg Glu Met Leu Arg Lys Gly Arg
1 5 10 15
Ala Val Val Val Arg Met Tyr Pro Phe Thr Ile Arg Ile Lys Asp Arg
20 25 30

Val Gly Gly Thr Met Gln Pro Val Ser Leu Lys Leu Asp Pro Gly Ser

35 40 45

Lys Thr Thr Gly Val Ala Val Ala Arg Glu Asp Glu Asp Lys Thr Glu

50 55 60

Ala Leu Trp Leu Gly Glu Ile Thr His Arg Gly Ala Gln Ile Arg Lys

65 70 75 80

Ser Leu Glu Gln Arg Gly Gly Tyr Arg Arg Arg Arg Arg Asn Ala Asn

85 90 95

Leu Arg His Arg Ala Pro Arg Phe Asn Asn Arg Arg Thr Pro Glu Gly

100 105 110

Arg Leu Met Pro Ser Leu Arg His Arg Val Asp Asn Val Val Ser Trp

115 120 125

Thr Arg Arg Leu Met Arg Trp Cys Pro Ile Thr Arg Ile Ala Met Glu

130 135 140

Leu Val Arg Phe Asp Met Gln Ala Met Gln Asn Pro Glu Ile Arg Gly

145 150 155 160

Val Glu Tyr Gln Arg Gly Ala Leu Phe Gly Tyr Glu Val Arg Glu Tyr

165 170 175

Leu Leu Glu Lys Trp Gly Arg Lys Cys Ala Tyr Cys Gly Ala Glu Gly

180 185 190

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

195 200 205

Asn Arg Val Ser Asn Leu Ala Leu Ala Cys Arg Pro Cys Asn Glu Gln

210 215 220

Lys Gly Ala Arg Pro Val Glu Glu Phe Leu Arg Gly Lys Pro Glu Val

225 230 235 240

Leu Arg Arg Val Leu Ala Gln Ala Lys Val Ser Leu Lys Asp Ala Ala

245 250 255

Ala Val Asn Ala Thr Arg Trp Thr Leu Trp Arg Ala Leu Lys Ala Thr

260 265 270

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

275 280 285

Cys Arg Leu Gly Val Pro Lys Thr His Ala Leu Asp Ala Leu Cys Val

290 295 300

Gly Arg Val Glu Ala Val Ser Gly Trp Gln Ile Pro Thr Leu Ala Ile

305 310 315 320

Arg Ala Thr Gly Arg Gly Ala Tyr Arg Arg Thr Gln Val Thr Ala Ser

325 330 335

Gly Phe Pro Arg Gly Tyr Leu Met Arg Lys Lys Thr Val Phe Gly Phe

340 345 350

Arg Thr Gly Asp Met Val Val Ala Ser Val Pro Thr Gly Lys Lys Ala

355 360 365

Gly Ile His Arg Gly Arg Val Ala Val Arg Glu Thr Gly Ser Phe Asn

370 375 380

Ile Gln Thr Ser Ala Gly Val Val Gln Gly Ile Gly His Lys Arg Cys

385 390 395 400

Arg Leu Arg Met Arg Ala Asp Gly Tyr Gly Tyr Gln Thr Asn Leu Glu

405 410 415

Thr Ala Leu Leu Pro Ser Leu Lys Gly Gly Val Ser Ala Pro Glu Ile

420 425 430

Arg

<210> 355

<211> 418

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-308 effector

<400> 355

Met Pro Cys His Pro Ala Arg Ala Arg Gln Met Leu Arg Glu Gly Arg

1 5 10 15

Ala Val Ile His Arg Thr Thr Pro Met Val Ile Arg Leu Lys Asp Arg
20 25 30

Thr Asp Gly Asp Thr Gln Ala Val Arg Leu Lys Phe Asp Pro Gly Ser
35 40 45
Lys Thr Thr Gly Ile Ala Leu Val Arg Gln Thr Pro Ser Ala Asp Leu
50 55 60
Ala Val Leu Asn Leu Met Glu Leu Ala His Arg Gly His Gln Ile Ser
65 70 75 80
Glu Ala Leu Thr Ala Arg Arg Gln Met Arg Arg Arg Arg Arg Gly Ser
85 90 95

Leu Arg Tyr Arg Ala Pro Arg Phe Leu Asn Arg Gly Asn Lys Ala Arg
100 105 110
Gly Trp Val Ala Pro Ser Leu Gln His Arg Val Asp Thr Ala Val Ala
115 120 125
Trp Val His Arg Leu Gln Arg Trp Thr Pro Ile Ala Ala Ile Ser Ser
130 135 140
Glu Leu Val Arg Phe Asp Met Gln Ala Leu Asp Asn Pro Asp Ile Glu
145 150 155 160

Gly Ala Gln Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu
165 170 175
Tyr Leu Leu Glu Lys Trp Gly Arg Ala Cys Ala Tyr Cys Gly Ala Lys
180 185 190
Asp Thr Pro Leu Gln Ile Glu His Ile Gln Pro Lys Ala Arg Gly Gly
195 200 205
Ser Asn Arg Ile Ser Asn Leu Thr Leu Ala Cys Gln Cys Cys Asn Glu
210 215 220

Ala Lys Ala Ala Gln Pro Ile Glu Ala Phe Leu Ala Lys Lys Pro Asp
225 230 235 240
Val Leu Arg Arg Ile Leu Ala Gln Ala Lys Arg Pro Leu Lys Asp Ala
245 250 255
Ala Ala Val Asn Ala Thr Arg Trp Ala Leu Val Asn Arg Leu Gln Ala

260 265 270

Thr Gly Leu Pro Val Glu Met Ala Ser Gly Gly Arg Thr Lys Phe Asn

275 280 285

Arg Ser Arg Leu Gln Val Pro Lys Thr His Ala Leu Asp Ala Ala Cys

290 295 300

Val Gly Ala Phe Gly Ser Leu Leu Arg Trp Arg Gln Pro Thr Leu His

305 310 315 320

Ile Lys Cys Thr Gly Arg Gly Ser Tyr Gln Arg Thr Arg Leu Thr Lys

325 330 335

His Gly Phe Pro Arg Gly Tyr Leu Met Arg Ser Lys Gln Val His Gly

340 345 350

Phe Gln Thr Gly Asp Leu Val Lys Ala Gln Val Pro Gln Gly Lys Lys

355 360 365

Ala Gly Ala Tyr Arg Gly Arg Val Ala Val Arg Ala Thr Gly Ser Phe

370 375 380

Asn Ile Gln Thr Gly Asn Gly Val Val Gln Gly Ile Ser Tyr Arg His

385 390 395 400

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

405 410 415

Ile Ala

<210> 356

<211> 254

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-309 effector

<400> 356

Met Pro Cys Arg Pro Ala Arg Ala Gln Asp Leu Leu Ala Cys Gly Arg

1 5 10 15

Ala Ala Val Tyr Arg Leu Gln Pro Phe Thr Ile Val Leu Lys Asp Arg

20 25 30

Ala Ala Gly Asp Val Gln Pro Val Glu Phe Lys Val Asp Pro Gly Ser

35 40 45

Lys Val Thr Gly Leu Ala Leu Val Ala Glu Phe Glu Lys Arg Gly Arg

50 55 60

Thr Val Val Trp Ala Ala Asn Leu Ala His Arg Gly His Arg Val Lys

65 70 75 80

Ala Ser Met Thr Asp Arg Ala Met Phe Arg Arg Gly Arg Arg Gly Arg

85 90 95

Lys Thr Arg Tyr Arg Ala Ala Arg Phe Glu Asn Arg Thr Arg Pro Thr

100 105 110

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

115 120 125

Trp Tyr Ser Arg Leu Leu Ser Arg Ala Ser Ile Ser Val Ala Gln Val

130 135 140

Glu Thr Ser Ser Phe Asp Thr Gln Leu Met Glu Asn Ala Asp Ile Ser

145 150 155 160

Gly Val Glu Tyr Gln Gln Gly Glu Leu Gln Gly Tyr Glu Val Arg Leu

165 170 175

Tyr Val Leu Glu Arg Gly Gly His Thr Cys Ser Tyr Cys Asp Ala Lys

180 185 190

Asp Val Ala Leu His Leu Asp His Val Leu Pro Arg Ser Arg Gly Gly

195 200 205

Ser Asn Arg Val Ser Asn Leu Val Pro Ala Cys Lys Pro Cys Asn Asp

210 215 220

Ala Lys Ser Asn Arg Ala Val Glu Asp Tyr Leu Val Asp Arg Pro Glu

225 230 235 240

Val Leu Arg Gln Val Lys Ala Gln Leu Arg Ser Pro Leu Lys

245 250

<210> 357

<211> 186

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-310 effector

<400> 357

Met Pro Cys Ser Glu Lys Arg Ala Gln Leu Leu Leu Arg Arg Arg Lys
1 5 10 15

Ala Val Val His Lys Ile Ala Pro Phe Thr Ile Arg Leu Lys Glu Arg
20 25 30

Ile Gly Gly Val Val Gln Pro Val Arg Ile Lys Leu Asp Pro Gly Ser
35 40 45

Lys Thr Thr Gly Ile Ala Leu Val Arg Glu Glu Glu Thr Val Ser Pro
50 55 60

Asp Ser Gly Lys Ile Glu Thr Thr Ala His Val Leu Phe Leu Ala Asp
65 70 75 80

Leu Glu His Arg Gly Gly Arg Ile Arg Asp Arg Leu Thr Ala Arg Arg
85 90 95

Ala Phe Arg Arg Arg Arg Arg Gly Asn Leu Arg Tyr Arg Lys Pro Arg
100 105 110

Phe Asp Asn Arg Thr Arg Pro Asp Gly Trp Leu Ala Pro Ser Leu Gln
115 120 125

His Arg Val Asp Thr Thr Met Ala Trp Val Asn Arg Phe Arg Lys Leu
130 135 140

Ser Pro Val Thr Gly Ile Ser Gln Glu Leu Val Arg Phe Asp Leu Gln
145 150 155 160

Lys Ile Glu Asn Pro Glu Ile Ala Gly Val Glu Tyr Gln His Gly Thr
165 170 175

Leu Ala Gly Tyr Glu Ile Arg Glu Tyr Leu
180 185

<210> 358

<211> 45

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223

> Description: MG35-311 effector

<400> 358

Met Pro Cys Ser Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg

1 5 10 15

Ala Arg Val His Arg Leu Val Pro Phe Thr Ile Arg Leu Ile Asp Arg

20 25 30

Glu Gln Glu Asp Cys Ala Leu Gln Pro Val Arg Leu Lys

35 40 45

<210> 359

<211> 440

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-312 effector

<400> 359

Met Pro Cys Ser Glu Lys Arg Ala Arg Leu Met Leu Gln Arg Gly Arg

1 5 10 15

Ala Arg Val Ala Arg Arg Phe Pro Phe Thr Ile Arg Leu Val Asp Arg

20 25 30

Leu Val Ala Asp Ser Ala Val Gln Pro Val Arg Ile Lys Ile Asp Pro

35 40 45

Gly Ser Lys Thr Thr Gly Leu Ala Val Val Arg Asp Glu Gly Gly Asn

50 55 60

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

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

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

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

305 310 315 320

Leu Ser Ile Lys Ala Thr Gly Arg Gly Ser Tyr Cys Arg Thr Arg Leu

325 330 335

Asp Lys Phe Gly Phe Pro Arg Gly Tyr Leu Thr Arg Gln Lys Arg Ile

340 345 350

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

355 360 365

Val His Val Gly Thr Trp Ile Gly Arg Val Ala Val Arg Ala Thr Gly

370 375 380

Ser Phe Asn Ile Gln Thr Ala Ser Gly Val Arg Gln Gly Ile Gly Trp

385 390 395 400

Lys Phe Cys Arg Val Leu Gln Arg Ala Asp Gly Tyr Gly Tyr Ser Ala

405 410 415

Thr Pro Thr Glu Arg Lys Val Ala Thr Ser Ser Pro Cys Leu Lys Ala

420 425 430

Gly Val Ser Val Ala Lys Ser Arg

435 440

<210> 360

<211> 124

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-313 effector

<400> 360

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

1 5 10 15

Ala Cys Val His Leu Val Met Pro Phe Thr Ile Arg Ile Val Asp Leu

20 25 30

Lys Ala Glu Asn Cys Ala Phe Gln Ala Leu Arg Val Lys Leu Asp Pro

35 40 45

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

100 105 110
Lys Lys Ala Gly Tyr Arg Gln Val Cys Asn Thr Gly
115 120

<210> 361
<211> 422
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-314 effector
<400> 361
Met Pro Cys Thr Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg
1 5 10 15

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

Ile Ser Glu Ala Leu Thr Ala Arg Arg Gly His Arg Arg Leu Arg Arg
85 90 95
Ser Lys Leu Arg Tyr Arg Pro Pro Arg Phe Asp Asn Arg Gly Asn Lys

100 105 110

Gln Arg Gly Trp Leu Ala Pro Ser Leu Gln His Arg Val Asp Thr Ser

115 120 125

Met Ala Trp Val Ser Arg Ile Gln Arg Leu Ala Pro Val Ser Ala Ile

130 135 140

Ser Thr Glu Leu Val Arg Phe Asp Met Gln Ala Met Glu Asn Pro Glu

145 150 155 160

Ile Glu Gly Met Gln Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val

165 170 175

Arg Glu Tyr Leu Leu Glu Lys Trp Gly Arg Thr Cys Ala Tyr Cys Gly

180 185 190

Ala Lys Asp Val Pro Leu Gln Ile Glu His Ile His Pro Lys Ser Lys

195 200 205

Asn Gly Ser Asp Arg Ile Asn Asn Leu Thr Leu Ala Cys Gln Cys Cys

210 215 220

Asn Gln Lys Lys Ala Ala Leu Pro Val Glu Met Phe Leu Ala Lys Lys

225 230 235 240

Pro Glu Leu Leu Lys Arg Ile Leu Ala Gln Ala Lys Arg Pro Leu Lys

245 250 255

Asp Ala Ala Ala Val Asn Ser Thr Arg Trp Ala Leu Val Asn Pro Leu

260 265 270

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

275 280 285

Phe Asn Arg Asn Gln Leu Gly Ile Pro Lys Thr His Ala Leu Asp Ala

290 295 300

Ala Cys Val Gly Glu Val Gly Ser Ile Thr Asp Trp Gln Lys Pro Thr

305 310 315 320

Leu Ser Ile Lys Ala Met Gly Arg Gly Ser Tyr Gln Arg Thr Arg Leu

325 330 335

Asp Lys Phe Gly Cys Val Arg Gly Tyr Leu Thr Arg Ser Lys Ser Ile

340 345 350

Lys Gly Phe Gln Thr Gly Asp Met Val Lys Ala Glu Val Thr Lys Gly
355 360 365

Lys Lys Ile Gly Ser Tyr Thr Gly Arg Val Ala Val Arg Ala Ser Gly
370 375 380

Ser Phe Asn Ile Gln Thr Ser Ala Gly Leu Val Gln Gly Val Ser Asp
385 390 395 400

Arg Tyr Cys Thr Val Val Gln Arg Gly Asn Gly Tyr Gly Tyr Ser Leu
405 410 415

Val Ala Lys Asn Gly Arg
420

<210> 362

<211> 450

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-315 effector

<400> 362

Met Pro Cys Thr Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg
1 5 10 15

Ala Cys Val His Leu Val Met Pro Phe Thr Ile Arg Ile Val Asp Leu
20 25 30

Lys Ala Glu Asn Cys Ala Phe Gln Ala Leu Arg Val Lys Leu Asp Pro
35 40 45

Gly Ser Lys Ala Thr Gly Ile Ala Leu Val Arg Glu Thr Glu Gly Lys
50 55 60

Gly Val Ala Val Val Asn Leu Phe Glu Leu Val His Arg Gly Arg Gln
65 70 75 80

Ile Ser Glu Ala Leu Thr Ala Arg Arg Gly Asn Arg Arg Leu Arg Arg
85 90 95

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

100 105 110

Gln Arg Gly Trp Leu Ala Pro Ser Leu Gln His Arg Val Asp Thr Ser

115 120 125

Met Ala Trp Val Ser Arg Ile Gln Arg Leu Ala Pro Val Ser Ala Ile

130 135 140

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

145 150 155 160

Ile Glu Gly Ala Gln Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val

165 170 175

Arg Glu Tyr Leu Leu Glu Lys Trp Asp Arg Thr Cys Ala Tyr Cys Gly

180 185 190

Ala Lys Asp Val Pro Leu Gln Ile Glu His Ile His Pro Lys Ser Lys

195 200 205

Asn Gly Ser Asp Arg Ile Asn Asn Leu Thr Leu Ala Cys Gln Cys Cys

210 215 220

Asn Gln Lys Lys Ala Ala Leu Pro Val Glu Met Phe Leu Ala Lys Lys

225 230 235 240

Pro Glu Leu Leu Glu Arg Ile Leu Ala Gln Ala Lys Arg Pro Leu Lys

245 250 255

Asp Ala Ala Ala Val Asn Ser Thr Arg Trp Ala Leu Val Asn Thr Leu

260 265 270

Lys Thr Thr Gly Leu Val Val Glu Thr Gly Thr Gly Gly Gln Thr Lys

275 280 285

Phe Asn Arg Ser Gln Phe Asp Ile Pro Lys Thr His Ala Leu Asp Ala

290 295 300

Ala Cys Val Gly Glu Val Gly Ser Ile Thr Asp Trp Gln Lys Pro Thr

305 310 315 320

Leu Ala Ile Lys Ala Met Gly Arg Gly Ser Tyr Gln Arg Thr Arg Leu

325 330 335

Asp Lys Phe Gly Cys Val Arg Gly Tyr Leu Thr Arg Ser Lys Ser Ile

340 345 350

Lys Gly Phe Gln Thr Gly Asp Met Val Lys Ala Glu Val Thr Thr Gly
355 360 365

Lys Lys Ile Gly Ser Tyr Thr Gly Arg Val Ala Val Arg Ala Thr Gly
370 375 380

Ser Phe Asn Ile Gln Thr Ser Thr Gly Leu Val Gln Gly Val Ser His
385 390 395 400

Arg Tyr Cys Thr Val Val Gln Arg Gly Asn Gly Tyr Gly Tyr Ser Leu
405 410 415

Gly Ala Lys Thr Asp Val Arg Gly Thr Pro Pro Gln His Arg Asp Ala
420 425 430

Ser His Pro Ala Leu Tyr Leu Pro Gly Leu Lys Ala Glu Val Ser Arg
435 440 445

Ala Asn
450

<210> 363
<211> 226
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors
<220><223> Description: MG35-316 effector
<400> 363

Met Pro Cys Thr Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg
1 5 10 15

Ala Cys Val His Leu Val Met Pro Phe Thr Ile Arg Ile Val Asp Leu
20 25 30

Lys Ala Glu Asn Cys Ala Phe Gln Ala Leu Arg Val Lys Leu Asp Pro
35 40 45

Gly Ser Lys Ala Thr Gly Ile Ala Leu Val Arg Glu Thr Glu Gly Asn
50 55 60

Gly Val Ala Val Val Asn Leu Phe Glu Leu Val His Arg Gly Arg Gln

65 70 75 80

Ile Ser Glu Ala Leu Thr Ala Arg Arg Gly His Arg Arg Leu Arg Arg

85 90 95

Ser Lys Leu Arg Tyr Arg Pro Pro Arg Phe Asp Asn Arg Gly Asn Gln

100 105 110

Lys Lys Gly Trp Leu Pro Pro Ser Leu Gln His Arg Val Asp Thr Ser

115 120 125

Met Ala Trp Val Ser Arg Ile Gln Arg Leu Ala Pro Val Ser Ala Ile

130 135 140

Ser Thr Glu Leu Val Arg Phe Asp Met Gln Ala Met Glu Asn Pro Glu

145 150 155 160

Ile Glu Gly Met Gln Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val

165 170 175

Arg Glu Tyr Leu Leu Glu Lys Trp Lys Arg Thr Cys Ala Tyr Cys Asp

180 185 190

Ala Lys Asp Val Pro Leu Gln Val Glu His Ile Gln Pro Lys Ala Lys

195 200 205

Gly Gly Ser Asn Arg Ile Ser Asn Leu Ala Leu Ala Cys Pro Ser Cys

210 215 220

Asn Ser

225

<210> 364

<211> 377

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220

><223> Description: MG35-317 effector

<400> 364

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

1 5 10 15

Ala Arg Val His Gln Leu Ile Pro Phe Ala Ile Arg Leu Thr Asp Arg
20 25 30
Val Ala Gln Thr Ser Asn Phe Gln Pro Leu Lys Ile Lys Leu Asp Pro
35 40 45
Gly Ser Lys Ala Ser Gly Leu Ala Val Cys Arg Val Ser Glu Lys Thr

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

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

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

245 250 255
Gln Val Lys Ala Pro Leu Arg Asp Ala Ala Ala Val Asn Ala Thr Arg

260 265 270

Trp Ala Val Phe Asn Met Leu Lys Gln Thr Gly Leu Pro Val Glu Thr

275 280 285

Gly Ser Gly Gly Gln Thr Lys Tyr Asn Arg Thr Arg Leu Gly Val Ile

290 295 300

Lys Thr His Ala Leu Asp Ala Ala Cys Val Gly Gln Val Gly Glu Val

305 310 315 320

Gln Gly Thr His Phe Asn Thr Leu Arg Val Thr Cys Thr Gly Arg Gly

325 330 335

Ser Arg Cys Lys Thr Arg Leu Asp Lys Tyr Gly Phe Pro Arg Thr Tyr

340 345 350

Leu Thr Arg Thr Lys Thr Ala Phe Gly Phe Arg Thr Gly Asp Thr Val

355 360 365

Ser Ala Val Val Pro Lys Gly Lys Lys

370 375

<210> 365

<211> 380

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-318 effector

<400> 365

Met Pro Glu Ala Val Val Lys Ala Leu Ile Thr Lys Ile Asp Pro Gly

1 5 10 15

Ser Lys Tyr Thr Gly Ile Val Leu Val Asp Asn Asn Asp Arg Val Leu

20 25 30

Phe Ala Ala Glu Ile Glu His Arg Gly Leu Phe Ile Lys Asn Lys Leu

35 40 45

Asp Ser Arg Arg Val Leu Arg Arg Gly Arg Arg Gly Arg Asn Thr Arg

50 55 60

Tyr Arg Gln Pro Arg Phe Leu Asn Arg Thr Arg Pro Asp Gly Trp Leu
65 70 75 80
Pro Pro Ser Leu Gln His Arg Leu Leu Thr Thr Met Thr Trp Ile Asp
85 90 95
Lys Phe Arg Arg Tyr Ala Glu Ile Ser Lys Leu Ala Val Glu Arg Val

100 105 110
Lys Phe Asp Met Gln Lys Met Gln Asn Pro Gly Ile Ser Gly Val Glu
115 120 125
Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Met Arg Glu Tyr Leu Leu
130 135 140
Glu Lys Trp Asn Arg Thr Cys Ala Tyr Cys Gly Lys Gln Asp Ile Pro
145 150 155 160
Leu Glu Ile Glu His Ile His Pro Lys Ser Lys Gly Gly Ser Asn Arg

165 170 175
Ile Ser Asn Leu Thr Leu Ala Cys Arg Ser Cys Asn Glu Lys Lys Gly
180 185 190
Asn Met Leu Ile Glu Glu Phe Leu Lys Asn Lys Pro Asp Val Leu Lys
195 200 205
Ile Ile Leu Ala Gln Ala Lys Ala Pro Leu Lys Asp Ala Ala Ala Val
210 215 220
Asn Ala Thr Arg Asn Met Leu Phe Lys Lys Leu Leu Asn Thr Gly Leu

225 230 235 240
Leu Val Glu Thr Gly Thr Gly Ala Gln Thr Lys Phe Asn Arg Ile Gly
245 250 255
Leu Lys Leu Pro Lys Glu His Trp Ile Asp Ala Ala Cys Val Gly Asp
260 265 270
Ser Gly Cys Asn Val Lys Val Asp Ser Asn Leu Lys Pro Leu Lys Ile
275 280 285
Lys Ala Thr Gly His Gly Asn Arg Arg Met Cys Ser Thr Asn Lys Tyr

290 295 300
Gly Phe Pro Ile Gln His Arg Thr Asn Lys Lys Phe His Phe Gly Phe

305 310 315 320

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

325 330 335

Gly Ile His Ile Gly Lys Val Met Cys Arg Ala Lys Gly Asn Phe Asp

340 345 350

Val Gln Thr Leu Lys Gly Lys Ile Gly Ala Ser Tyr Lys Asn Cys Ser

355 360 365

Ile Leu Ser Arg Lys Asp Gly Tyr Ile Tyr Asn Thr

370 375 380

<210> 366

<211> 412

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-319 effector

<400> 366

Met Pro Thr Ser Ala Val Arg Ala Arg Lys Leu Leu Gly Ser Gly Lys

1 5 10 15

Ala Ala Val Ile Arg Arg Phe Pro Phe Thr Ile Ile Leu Lys Glu Arg

20 25 30

Ser Ser Gly Glu Val Gln Ser Leu Arg Leu Lys Leu Asp Pro Gly Ser

35 40 45

Lys Glu Thr Gly Met Ala Ile Val Asn Glu Thr Met Lys Val Val Val

50 55 60

Phe Ala Ala Val Leu Ala His Arg Gly Ala Ala Ile Lys Ala Lys Leu

65 70 75 80

Asp Ser Arg Arg Ala Thr Arg Arg Gly Arg Arg Asn Arg Ser Thr Arg

85 90 95

Tyr Arg Gly Pro Arg Phe Asn Asn Arg Arg Arg Pro Ala Gly Trp Leu

100 105 110

Pro Pro Ser Leu Gln His Arg Val Glu Thr Ile Met Thr Trp Val Arg
115 120 125

Arg Phe Ser Trp Leu Ala Pro Ile Thr Ala Ile Ser Gln Glu Leu Val
130 135 140

Arg Phe Asp Leu Gln Lys Ile Glu Asn Pro Glu Ile Ser Gly Ile Glu
145 150 155 160

Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Ala Arg Gln Tyr Leu Leu
165 170 175

Gln Lys Trp Gly His Ala Cys Ala Tyr Cys Gly Val Gln Asn Val Pro
180 185 190

Leu Glu Val Glu His Ile His Pro Lys Ala Lys Gly Gly Thr Asn Arg
195 200 205

Val Ser Asn Leu Ala Ile Ala Cys Lys Pro Cys Asn Thr Arg Lys Gly
210 215 220

Cys Leu Asp Val Ala Ile Phe Leu Lys Gly Lys Pro Asp Leu Leu Lys
225 230 235 240

Lys Ile Glu Ala Gln Ala Lys Arg Pro Leu Lys Asp Ala Thr Ala Val
245 250 255

Asn Ala Thr Arg Trp Ala Leu Tyr Glu Arg Leu Gln Ala Thr Ser Leu
260 265 270

Pro Val Glu Thr Gly Ser Gly Gly Arg Thr Lys Tyr Asn Arg Thr Leu
275 280 285

Leu Gly Leu Pro Lys Glu His Trp Ile Asp Ala Ala Cys Val Gly Glu
290 295 300

Ser Gly Ala Ser Thr Asn Val Pro Lys Gly Met Met Pro Leu Val Ala
305 310 315 320

Arg Ala Ala Gly His Gly Asn Arg Gln Ile Cys Ala Thr Asp Ala Phe
325 330 335

Gly Phe Pro Lys Arg His Arg Thr Ser Gln Lys Ser Phe Phe Gly Phe
340 345 350

Gln Thr Gly Asp Met Val Cys Ala Ile Val Pro Ser Gly Lys Lys Gln

355 360 365

Gly Ile His Thr Gly Arg Leu Leu Val Arg Ala Thr Gly Ser Phe Asp

370 375 380

Ile Gln Thr Ala Ala Gly Arg Val Ser Gly Ile Asn His Arg His Cys

385 390 395 400

Gly Ala Ile His Arg Lys Asp Gly Tyr Ala Tyr Gln

405 410

<210> 367

<211> 190

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-320 effector

<400> 367

Met Gln His Arg Val Ala Thr Ile Met Thr Trp Val Gly Arg Leu Ser

1 5 10 15

Arg Ile Ala Thr Ile Thr Ala Leu Ser Gln Glu Leu Val Arg Phe Asp

20 25 30

Leu Gln Lys Ile Glu Lys Pro Glu Ile Ser Gly Val Asp Leu Ala Gly

35 40 45

Tyr Glu Ala Arg Gln Tyr Leu Leu Gln Lys Trp Gly His Ala Cys Ala

50 55 60

Tyr Cys Gly Val Gln Asn Val Pro Leu Glu Val Glu His Ile His Pro

65 70 75 80

Lys Ala Lys Gly Gly Thr Asn Arg Val Ser Asn Leu Cys Ile Ala Cys

85 90 95

Asn Pro Cys Asn Thr Lys Lys Gly Cys Ser Asp Ile Ala Val Phe Trp

100 105 110

Lys Asp Lys Pro Asp Leu Leu Arg Lys Ile Glu Thr Gln Ala Lys His

115 120 125

Pro Leu Lys Asp Ala Thr Ala Val Asn Ala Thr Arg Trp Ala Leu Phe
130 135 140
Glu Lys Leu Lys Ala Ile Gly Leu Pro Phe Glu Val Gly Ser Gly Gly

145 150 155 160
Arg Tyr Ser Asn Leu Ile Val Gln Cys Trp Ser Ser Thr Lys Ser Thr
165 170 175
Gly Ser Met Pro Leu Val Ser Gly Ser Leu Val Pro Ile Ser
180 185 190

<210> 368
<211> 428
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-321 effector

<400> 368
Met Gln Lys Val Phe Val Val Asp Lys Asn Gly Arg Pro Leu Met Pro
1 5 10 15
Cys Ser Pro Thr Arg Cys Lys Gln Phe Lys Lys Glu Gly Arg Ser Arg
20 25 30
Val Tyr Arg Leu Lys Pro Phe Thr Ile Gln Leu Ile Asp Val Glu Gly
35 40 45
Gly Glu Thr Lys Asp Val Glu Tyr Lys Val Asp Ala Gly Ser Lys Phe
50 55 60

Thr Gly Leu Ala Leu Val Gly Asn Phe Glu Lys Gln Gly Asn Val Leu
65 70 75 80
Leu Trp Ala Ala Asn Leu Gln His Arg Gly Gln Glu Ile Lys Asn Ala
85 90 95
Leu Glu Ser Arg Arg Ser Leu Arg Arg Gly Arg Arg Asn Arg Lys Lys
100 105 110
Arg Tyr Arg Ala Ala Arg Trp Arg Phe Arg Asn Gly Ile Lys Gly Gly

115 120 125

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

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

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

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

Gln Thr Gly Asp Leu Val Lys Leu Asp Gln Pro Lys Gly Lys Tyr Ala
370 375 380

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

<210> 369
<211> 424
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors

<220><223> Description: MG35-322 effector
<400> 369
Met Gln Asn Tyr Val Phe Val Leu Asp Thr Asn Lys Gln Pro Leu Asn
1 5 10 15
Pro Val Thr Pro Lys Arg Ala Arg Glu Leu Leu Thr Lys Gln Lys Ala
20 25 30
Ser Val Phe Arg Met Tyr Pro Phe Thr Ile Ile Leu Lys His Ala Val
35 40 45
Pro Asn Pro Ala Ser Lys Ile Leu Thr Ile Lys Leu Asp Pro Gly Ser

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

Gln Ala Lys Phe Asn Asn Arg Lys Arg Lys Glu Gly Trp Leu Ala Pro

115 120 125

Ser Leu Met His Arg Val Leu Thr Ile Glu Thr Trp Val Lys Arg Leu

130 135 140

Cys Arg Tyr Ala Pro Ile Thr Ser Ile Ala Met Glu Leu Val Lys Phe

145 150 155 160

Asp Thr Gln Lys Leu Gln Asn Pro Glu Ile Asp Gly Val Glu Tyr Gln

165 170 175

Gln Gly Glu Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys

180 185 190

Trp Gly Arg Lys Cys Val Tyr Cys Asp Lys Gln Asp Val Pro Leu Gln

195 200 205

Ile Glu His Ile His Pro Arg Ser Lys Gly Gly Ser Asn Arg Val Ser

210 215 220

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

225 230 235 240

Phe Ile Asp Glu Phe Leu Lys Lys Asp Gly Ala Arg Leu Glu Lys Ile

245 250 255

Lys His Gln Ala Lys Gln Pro Leu Lys Asp Ala Ala Thr Val Asn Ala

260 265 270

Thr Arg Trp Thr Leu Phe Arg Ile Leu Lys Asn Ile Leu Pro Thr Thr

275 280 285

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

290 295 300

Pro Lys His His Trp Val Asp Ala Ala Cys Val Gly Lys Val Glu Lys

305 310 315 320

Leu Asn Ile Leu Thr Thr His Pro Leu Arg Ile Lys Cys Thr Gly Trp

325 330 335

Gly Thr Arg Gln Met Cys Gly Thr Asn Lys Tyr Gly Phe Pro Ile Arg

340 345 350

His Arg Glu Arg Lys Gln Val His Phe Gly Phe Arg Thr Gly Asp Ile

355 360 365

Ala Lys Ala Val Val Thr Ser Gly Lys Lys Val Gly Gln Tyr Val Gly

370 375 380

Arg Val Leu Cys Arg Lys Thr Gly Asn Phe Asp Ile Ala Thr Lys Ala

385 390 395 400

Gly Arg Val Ala Gly Ile Ser His Lys Phe Cys Ser Pro Ile His Lys

405 410 415

Asn Asp Gly Tyr Ser Tyr Ala Phe

420

<210> 370

<211> 339

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-323 effector

<400> 370

Met Gln Pro Val Glu Phe Lys Val Asp Pro Gly Ser Lys Val Thr Gly

1 5 10 15

Leu Ala Leu Val Ala Glu Phe Glu Lys Arg Gly Arg Thr Val Val Trp

20 25 30

Ala Ala Asn Leu Ala His Arg Gly Tyr Arg Val Lys Ala Ser Ile Thr

35 40 45

Asp Arg Ala Met Phe Arg Arg Gly Arg Arg Gly Arg Lys Thr Arg Tyr

50 55 60

Arg Ala Ala Arg Phe Glu Asn Arg Thr Arg Pro Thr His Trp Leu Ala

65 70 75 80

Pro Ser Leu Gln Ser Arg Val Leu Asn Val Lys Ser Trp Tyr Ser Arg

85 90 95

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

100 105 110

Phe Asp Thr Gln Leu Met Glu Asn Ala Asp Ile Ser Gly Val Glu Tyr

115 120 125

Gln Gln Gly Glu Leu Gln Gly Tyr Glu Val Arg Gln Tyr Val Leu Glu

130 135 140

Arg Gly Gly His Thr Cys Ser Tyr Cys Asp Ala Lys Asp Val Ala Leu

145 150 155 160

His Leu Asp His Val Leu Pro Arg Ser Arg Gly Gly Ser Asn Arg Val

165 170 175

Ser Asn Leu Val Pro Ala Cys Lys Pro Cys Asn Asp Ala Lys Ser Asn

180 185 190

Arg Ala Val Glu Asp Tyr Leu Val Asp Arg Pro Glu Val Leu Arg Gln

195 200 205

Val Lys Ala Gln Leu Arg Ser Pro Leu Lys Asp Ala Ala Val Met Asn

210 215 220

Ala Thr Arg Phe Ala Ile Val Asp Ala Leu Arg Glu Phe Gly Leu Glu

225 230 235 240

Val Arg Met Trp Ser Gly Gly Arg Thr Lys Trp Asn Arg Thr Asn Leu

245 250 255

Gly Leu Pro Lys Asp His Trp Ile Asp Ala Ala Cys Val Gly Glu Ser

260 265 270

Gly Ala Ala Val Arg Val Pro Val Leu Arg Pro Leu Thr Ile Thr Ala

275 280 285

Met Gly Arg Gly His Arg Arg Val His Gly Asn Asp Arg Tyr Gly Phe

290 295 300

Pro Arg Gly Thr Ala Arg Arg Ala Lys Arg Val Ala Gly Phe Gln Thr

305 310 315 320

Gly Asp Leu Val Arg Leu Val Cys Leu Arg Gly Lys Cys Ala Gly Val

325 330 335

His Thr Gly

<210> 371

<211> 279

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-324 effector

<400> 371

Met Gln Gln Met Val Thr Pro Glu Ile Ser Gly Val Glu Tyr Gln Gln
1 5 10 15

Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys Trp
20 25 30

Gly Arg Thr Cys Val Tyr Cys Asp His Thr Asp Arg Pro Leu Gln Val
35 40 45

Glu His Leu Thr Pro Thr Gly Ser Gly Gly Ser Asp Gln Val Ser Asn
50 55 60

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

Val Glu Val Tyr Leu Ala Asp Asp Pro Val Arg Arg Asp Arg Ile Leu
85 90 95

Arg Gln Ala Gln Gln Pro Leu Arg Asp Ala Ala Ala Val Asn Ala Thr
100 105 110

Arg Trp Ala Ile Trp Glu Met Leu Thr Arg Thr Gly Val Pro Val Glu
115 120 125

Ala Thr Thr Gly Gly Arg Thr Lys Trp Asn Arg Thr Arg Met Gly Ile
130 135 140

Pro Lys Arg Asp Ala Trp Asp Ala Ala Cys Ala Gly Thr Val Asp Gln
145 150 155 160

Val Leu Gly Trp Asp Arg Pro Ile Gln Arg Val Asp Cys Leu Gly Arg
165 170 175

Gly Ser His Gln Arg Thr Arg Val Thr Lys Asp Gly Phe Pro Arg Gly
180 185 190

Tyr Leu Pro Arg Thr Lys Met Val Gln Gly Phe Arg Thr Gly Asp His
195 200 205

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

Ile Arg Pro Ser Ser Val Ala
275

<210> 372
<211> 77
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-325 effector
<400> 372
Met Gln Arg Ala Phe Val Leu Ser Lys Thr Lys Lys Pro Leu Met Pro
1 5 10 15
Cys His Pro Ala Arg Ala Arg Glu Leu Leu Lys Lys Lys Lys Ala Lys
20 25 30

Val Tyr Arg Leu Lys Ala Phe Thr Ile Ile Leu Thr Glu Arg Glu Asp
35 40 45
Gly Glu Thr Gln Glu Val Glu Leu Lys Val Asp Pro Gly Ser Lys Thr
50 55 60
Ser Gly Met Ala Leu Val Ala Thr Cys Lys Arg Gly Lys
65 70 75
<210> 373

<211> 151

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-326 effector

<400> 373

Met Gln Arg Val Phe Val Leu Asp Ala Lys Gly Glu Pro Leu Met Pro
1 5 10 15

Cys Arg Pro Thr Arg Ala Arg Arg Leu Leu Lys Ala Gly Arg Ala Ala
20 25 30

Val Phe Lys Arg Tyr Pro Phe Thr Ile Val Leu Lys Ala Arg Glu Gly
35 40 45

Gly Glu Thr Gln Gly Thr Gln Leu Lys Ile Asp Pro Gly Ala Arg Thr
50 55 60

Thr Gly Leu Ala Leu Val Ala Asp Phe Lys Arg Gly Lys Arg Val Val
65 70 75 80

Trp Ala Ala Glu Leu Ser His Arg Gly Gln Ala Ile Lys Gln Ala Leu
85 90 95

Glu Lys Arg Arg Ala Ser Arg Arg Ser Arg Arg Ala Arg His Thr Arg
100 105 110

Tyr Arg Pro Ala Arg Phe Asn Asn Arg Arg Arg Pro Glu Ser Trp Leu
115 120 125

Pro Pro Ser Leu Arg Ser Arg Val Glu Asn Val Leu Thr Trp Val Lys
130 135 140

Arg Leu Gly Lys Ala Thr Pro
145 150

<210> 374

<211> 73

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-327 effector

<400> 374

Met Gln Thr Lys Gly Lys Gly Ser Lys Val Phe Val Ala Ala Arg Lys

1 5 10 15

Ser Arg Ser Arg Leu Leu Thr Phe Pro Arg Gly Asp Leu Pro Lys Gly

20 25 30

Leu Arg His Gln Ala Arg Lys Gly Arg Arg Ile Cys Met Ala Val Phe

35 40 45

Val Leu Asp Arg Ser Gly Arg Pro Leu Met Pro Cys Thr Glu Lys Arg

50 55 60

Val Leu Met Ala Val Gln Lys Arg Val

65 70

<210> 375

<211> 338

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-328 effector

<400> 375

Met Gln Thr Lys Gly Lys Gly Ser Lys Val Leu Val Ala Ile Tyr Lys

1 5 10 15

Asp Arg Ser Arg Leu Leu Thr Phe Pro Arg Gly Asp Ser Pro Pro Leu

20 25 30

Lys Ala Val Tyr Ala Thr Ser Pro Val Arg Glu Lys Gly Phe Met Ala

35 40 45

Val Phe Val Leu Asp Lys Arg Gly Lys Pro Leu Met Gln Cys Ser Glu

50 55 60

Lys Arg Ala Arg Leu Leu Leu Asp Arg Asp Arg Ala Arg Ile His Lys
65 70 75 80
Met Leu Pro Phe Thr Ile Arg Val Val Asp Arg Leu Val Glu Asp Ser
85 90 95
Gln Leu Gln Pro Leu Glu Ile Lys Leu Asp Pro Gly Ser Lys Thr Thr

100 105 110
Gly Val Ala Val Val Arg Ile Ser Val Ala Val Asp Ala Gln Thr Gly
115 120 125
Glu Val Gln Lys Arg Val His Val Leu Asn Leu Phe Glu Leu Ile His
130 135 140
Arg Ser Arg Gln Ile Thr Glu Ala Ile Met Gly Arg Arg Gly His Arg
145 150 155 160
Arg Leu Arg Arg Ser Lys Leu Arg Tyr Arg Ala Pro Arg Phe Asp Asn

165 170 175
Arg Gly Asn Gln Lys Lys Gly Trp Leu Pro Pro Ser Leu Gln His Leu
180 185 190
Val Asp Thr Ser Leu Glu Trp Val Lys Arg Ile Glu Lys Leu Ala Pro
195 200 205
Ile Ser Gly Ile Ser Thr Glu Leu Val Arg Phe Asp Met Gln Ala Met
210 215 220
Glu Asn Pro Glu Ile Glu Gly Met Gln Tyr Gln Gln Gly Thr Leu Ala

225 230 235 240
Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys Trp Asp Arg Thr Cys
245 250 255
Ala Tyr Cys Gly Ala Lys Asp Val Pro Leu Gln Ile Glu His Ile His
260 265 270
Pro Lys Ser Lys Asn Gly Ser Asp Arg Ile Asn Asn Leu Thr Leu Ala
275 280 285
Cys Gln Cys Cys Asn Gln Lys Lys Ala Ala Leu Pro Val Glu Met Phe

290 295 300
Leu Ala Lys Lys Pro Lys Leu Leu Lys Arg Ile Leu Ala Gln Ala Lys

305 310 315 320

Arg Pro Leu Lys Asp Ala Ala Ala Val Asn Ser Thr Arg Trp Ala Leu

325 330 335

Val Asn

<210> 376

<211> 317

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220

><223> Description: MG35-329 effector

<400> 376

Met Gln Thr Lys Gly Lys Gly Ser Lys Val Leu Val Ala Thr Arg Lys

1 5 10 15

Ser Arg Ser Arg Leu Leu Thr Phe Pro Arg Gly Asp Ser Pro Pro Leu

20 25 30

Lys Ala Val Asp Val Thr Arg Pro Val Arg Glu Lys Val Phe Met Ala

35 40 45

Val Phe Val Leu Asp Lys Arg Gly Lys Pro Leu Met Pro Cys Ser Glu

50 55 60

Lys Arg Ala Arg Leu Leu Leu Asp Arg Gly Arg Ala Arg Ile His Lys

65 70 75 80

Met Leu Pro Phe Thr Ile Arg Val Val Asp Arg Leu Val Glu Asp Ser

85 90 95

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

100 105 110

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

115 120 125

Glu Val Gln Lys His Val His Val Leu Asn Leu Phe Asp Leu Ile His

130 135 140

Arg Ser Arg Gln Ile Thr Glu Ala Leu Ile Gly Arg Arg Gly His Arg
145 150 155 160
Arg Leu Arg Arg Ser Lys Leu Arg Tyr Arg Ala Pro Arg Phe Asn Asn
165 170 175
Arg Gly Asn Gln Lys Lys Gly Trp Leu Pro Pro Ser Leu Gln His Leu

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

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

305 310 315
<210> 377
<211> 265
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-330 effector
<400> 377
Met Gln Thr Lys Gly Lys Gly Ser Lys Val Leu Val Ala Thr Arg Lys

1 5 10 15

Ser Arg Ser Arg Leu Leu Thr Phe Pro Arg Gly Asp Trp Ser Gln Gly

20 25 30

Gln Arg Asn Lys Ser Arg Lys Gly Glu Arg Phe Glu Met Ala Val Phe

35 40 45

Val Leu Asp Arg Ser Gly Arg Pro Leu Met Pro Cys Thr Glu Lys Arg

50 55 60

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

65 70 75 80

Pro Phe Thr Ile Arg Ile Val Asp Leu Lys Ala Glu Asn Cys Ala Phe

85 90 95

Gln Ala Leu Arg Val Lys Leu Asp Pro Gly Ser Lys Ala Thr Gly Ile

100 105 110

Ala Leu Val Arg Glu Thr Glu Gly Lys Gly Val Ala Val Val Asn Leu

115 120 125

Phe Glu Leu Val His Arg Gly Arg Gln Ile Ser Glu Ala Leu Thr Ala

130 135 140

Arg Arg Gly His Arg Arg Leu Arg Arg Ser Lys Leu Arg Tyr Arg Pro

145 150 155 160

Pro Arg Phe Asp Asn Arg Gly Asn Lys Gln Arg Gly Trp Leu Ala Pro

165 170 175

Ser Leu Gln His Arg Val Asp Thr Ser Met Ala Trp Val Ser Arg Ile

180 185 190

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

195 200 205

Asp Ala Gln Ala Leu Glu Asn Pro Glu Ile Glu Gly Ala Gln Tyr Gln

210 215 220

Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys

225 230 235 240

Trp Asp Arg Thr Cys Ala Tyr Cys Gly Ala Lys Asn Val Pro Leu Gln

245 250 255

Val Glu His Ile Arg Pro Lys Ala Lys
260 265

<210> 378

<211> 507

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-331 effector

<400> 378

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

Ser Arg Ser Arg Leu Leu Thr Phe Pro Arg Gly Asp Trp Ser Gln Gly
20 25 30

Gln Arg Asn Lys Ser Arg Lys Gly Glu Arg Phe Glu Met Ala Val Phe
35 40 45

Val Leu Asp Arg Ser Gly Arg Pro Leu Met Pro Cys Thr Glu Lys Arg
50 55 60

Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Cys Val His Leu Val Met
65 70 75 80

Pro Phe Thr Ile Arg Ile Val Asp Leu Lys Ala Glu Asn Cys Ala Phe
85 90 95

Gln Ala Leu Arg Val Lys Leu Asp Pro Gly Ser Lys Ala Thr Gly Ile
100 105 110

Ala Leu Val Arg Glu Thr Glu Gly Lys Gly Val Ala Val Val Asn Leu
115 120 125

Phe Glu Leu Val His Arg Gly Arg Gln Ile Ser Glu Ala Leu Thr Ala
130 135 140

Arg Arg Gly His Arg Arg Leu Arg Arg Ser Leu Leu Arg Tyr Arg Pro
145 150 155 160

Pro Arg Phe Asp Asn Arg Gly Asn Lys Gln Arg Gly Trp Leu Ala Pro

165 170 175

Ser Leu Gln His Arg Val Asp Thr Ser Met Ala Trp Val Ser Arg Ile

180 185 190

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

195 200 205

Asp Met Gln Ala Met Glu Asn Pro Glu Ile Glu Gly Met Gln Tyr Gln

210 215 220

Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys

225 230 235 240

Trp Asp Arg Thr Cys Ala Tyr Cys Gly Ala Lys Asp Val Pro Leu Gln

245 250 255

Ile Glu His Ile His Pro Lys Ser Lys Asn Gly Ser Asn Arg Ile Ser

260 265 270

Asn Leu Ala Leu Ala Cys Gln Cys Cys Asn Gln Lys Lys Ala Ala Leu

275 280 285

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

290 295 300

Leu Ala Gln Ala Lys Arg Pro Leu Lys Asp Ala Ala Ala Val Asn Ser

305 310 315 320

Thr Arg Trp Ala Leu Val Asn Ala Leu Lys Ala Thr Gly Leu Pro Val

325 330 335

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

340 345 350

Ile Pro Lys Thr His Ala Leu Asp Ala Ala Cys Val Gly Glu Val Gly

355 360 365

Ser Ile Thr Asp Trp Gln Lys Pro Thr Leu Ala Ile Lys Ala Met Gly

370 375 380

Arg Gly Ser Tyr Gln Arg Thr Arg Leu Asp Lys Phe Gly Cys Val Arg

385 390 395 400

Gly Tyr Leu Thr Arg Ser Lys Ser Ile Lys Gly Phe Gln Thr Gly Asp

405 410 415

Met Val Lys Ala Glu Val Thr Lys Gly Lys Lys Ile Gly Thr Tyr Met
420 425 430
Gly Arg Val Ala Val Arg Ala Ser Gly Ser Phe Asn Ile Gln Thr Gly
435 440 445

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

<210> 379
<211> 179

<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-333 effector
<400> 379
Met Arg Ser Gln Phe Leu Ala Leu Ser Phe Ala Ile Lys Gln Thr Tyr
1 5 10 15
Arg Val Glu Val Ser Val Val Asn Pro Lys Ser Phe Arg Asn Ile Ala
20 25 30
Lys Ala Asn Ile Thr Arg Lys Glu Thr Gln Ala Leu Ser Lys Val Phe

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

85 90 95

Ser Leu Arg Val Lys Ile Asp Pro Gly Ala Lys Thr Thr Gly Leu Gly

100 105 110

Leu Val Asn Asp Ser Thr Gly Glu Val Val Trp Ala Ala Gln Leu Gln

115 120 125

His Arg Gly Phe Gln Ile Arg Asp Ala Leu Thr Ser Arg Arg Gln Leu

130 135 140

Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg Lys Ser Arg Phe

145 150 155 160

Leu Asn Arg Thr Arg Pro Glu Gly Trp Leu Pro Pro Ser Leu Asn Ser

165 170 175

Arg Val Ala

<210> 380

<211> 226

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-334 effector

<400> 380

Met Arg Ser Gln Phe Leu Ala Leu Ser Phe Ala Ile Lys Gln Thr Tyr

1 5 10 15

Arg Val Glu Val Ser Val Val Asn Pro Lys Ser Phe Arg Asn Ile Ala

20 25 30

Lys Ala Asn Ile Thr Arg Lys Glu Thr Gln Ala Leu Ser Lys Val Phe

35 40 45

Val Leu Asp Thr Asn Lys Gln Pro Leu Asn Pro Ile His Ser Gly Arg

50 55 60

Ala Arg Met Leu Leu Ser Gln Gly Lys Ala Ala Val Phe Arg Arg Tyr

65 70 75 80

Pro Phe Thr Val Ile Leu Asn Lys Glu Val Val Asn Pro Lys Val Glu
85 90 95

Ser Leu Arg Val Lys Ile Asp Pro Gly Ala Lys Thr Thr Gly Leu Gly
100 105 110
Leu Val Asn Asp Ser Thr Gly Glu Val Val Trp Ala Ala Gln Leu Gln
115 120 125
His Arg Gly Phe Gln Ile Arg Asp Ala Leu Thr Ser Arg Arg Gln Leu
130 135 140
Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg Lys Ser Arg Phe
145 150 155 160

Leu Asn Arg Thr Arg Pro Glu Gly Trp Leu Pro Pro Ser Leu Asn Ser
165 170 175
Arg Val Ala Asn Ile Leu Thr Trp Val Asn Arg Leu Ser Ser Ile Ser
180 185 190
Gln Ile Thr Ala Ile Ser Gln Glu Leu Val Arg Phe Asp Thr Gln Gln
195 200 205
Met Glu Asp Ala Glu Ile Ser Gly Ile Gly Tyr Gln Gln Gly Thr Leu
210 215 220

Phe Gly
225

<210> 381
<211> 471
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-335 effector
<400> 381
Met Arg Ser Gln Phe Leu Ala Leu Ser Phe Ala Ile Lys Gln Thr Tyr
1 5 10 15
Arg Val Glu Val Ser Val Val Asn Pro Lys Ser Phe Arg Asn Ile Ala

20 25 30

Lys Ala Asn Ile Thr Arg Lys Glu Thr Gln Ala Leu Ser Lys Val Phe

35 40 45

Val Leu Asp Thr Asn Lys Gln Pro Leu Asn Pro Ile His Ser Gly Arg

50 55 60

Ala Arg Met Leu Leu Ser Gln Gly Lys Ala Ala Val Phe Arg Arg Tyr

65 70 75 80

Pro Phe Thr Val Ile Leu Asn Lys Glu Val Val Asn Pro Lys Val Glu

85 90 95

Ser Leu Arg Val Lys Ile Asp Pro Gly Ala Lys Thr Thr Gly Leu Gly

100 105 110

Leu Val Asn Asp Ser Thr Gly Glu Val Val Trp Ala Ala Gln Leu Gln

115 120 125

His Arg Gly Phe Gln Ile Arg Asp Ala Leu Thr Ser Arg Arg Gln Leu

130 135 140

Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg Lys Ser Arg Phe

145 150 155 160

Leu Asn Arg Thr Arg Pro Glu Gly Trp Leu Pro Pro Ser Leu Asn Ser

165 170 175

Arg Val Ala Asn Ile Leu Thr Trp Val Asn Arg Leu Ser Ser Ile Ser

180 185 190

Gln Ile Thr Ala Ile Ser Gln Glu Leu Val Arg Phe Asp Thr Gln Gln

195 200 205

Met Glu Asp Ala Glu Ile Ser Gly Ile Gly Tyr Gln Gln Gly Thr Leu

210 215 220

Phe Gly Tyr Glu Ile Arg Glu Phe Leu Leu Glu Lys Trp Asn Arg Thr

225 230 235 240

Cys Ala Tyr Cys Gly Glu Lys Asp Thr Gln Leu Glu Ile Glu His Ile

245 250 255

Asn Ala Arg Ser Lys Gly Gly Ser Asn Arg Ile Ser Asn Leu Cys Leu

260 265 270

Ala Cys Thr Ser Cys Asn Gln Lys Lys Gly Asn Gln Asp Ile Lys Asp

275 280 285

Phe Leu Lys Gly Lys Pro Asp Leu Leu Lys Cys Ile Leu Ser Gln Ala

290 295 300

Lys Arg Pro Leu Ala Asp Thr Ala Ala Val Asn Ala Thr Arg Trp Asn

305 310 315 320

Leu Tyr Tyr Asn Leu Lys Lys Thr Gly Leu Pro Val Glu Val Gly Thr

325 330 335

Gly Gly Arg Thr Lys Tyr Asn Arg Thr Ile Arg Gly Leu Asp Lys Thr

340 345 350

His Tyr Trp Asp Ala Ala Cys Val Gly Ala Ser Thr Pro Glu Gln Leu

355 360 365

Ile Thr Ser Glu Val Lys Pro Leu Leu Ile Ala Ala Lys Gly His Gly

370 375 380

Thr Arg Gln Gln Cys Arg Thr Asp Arg Phe Gly Phe Pro Ser Arg Tyr

385 390 395 400

Cys Lys Arg Thr Lys Phe His Lys Gly Phe Gln Thr Gly Asp Ile Val

405 410 415

Lys Ala Val Val Thr Ser Gly Lys Lys Ile Gly Thr Tyr Val Gly Arg

420 425 430

Val Ala Thr Arg Ala Thr Gly Ser Phe Asn Ile Ser Thr Thr Asp Gly

435 440 445

Leu Val Gln Gly Ile Ser His Lys Tyr Cys Leu Pro Leu His Lys Lys

450 455 460

Asp Gly Tyr Ser Tyr Ile Gln

465 470

<210> 382

<211> 430

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-336 effector

<400> 382

Met Arg Val Phe Val Leu Asp Lys His Gly Asp Pro Leu Met Pro Cys
1 5 10 15

Ser Pro Ala Arg Ala Arg Glu Met Leu Lys Gln Gly Arg Ala Arg Val
20 25 30

His Arg Ile Tyr Pro Phe Ala Ile Arg Leu Thr Asp Arg Ala Gly Gly
35 40 45

Asp Glu Gln Pro Val Arg Ile Lys Ile Asp Pro Gly Ser Gln Phe Thr
50 55 60

Gly Met Ala Leu Val Arg Glu Glu Thr Glu Ser Ser His Val Leu Ser
65 70 75 80

Leu Phe Glu Leu Arg His Arg Gly Arg Gln Ile Ser Glu Ala Leu Thr
85 90 95

Ala Arg Arg Arg Met Arg Arg Ala Arg Arg Gly Arg Lys Thr Arg Tyr
100 105 110

Arg Ala Pro Arg Phe Leu Asn Arg Arg Arg Ala Pro Gly Trp Ile Ala
115 120 125

Pro Ser Leu Gln His Arg Val Asp Thr Thr Ile Ala Trp Val Ala Arg
130 135 140

Leu Arg Lys Leu Ser Pro Val Val Gly Ile Val Gln Glu Leu Val Arg
145 150 155 160

Phe Asp Met Gln Ala Met Glu Ser Pro Gly Ile Glu Gly Ala Gln Tyr
165 170 175

Gln Arg Gly Glu Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu
180 185 190

Lys Trp Gly Arg Gln Cys Ala Tyr Cys Asp Ile Gln Asp Val Pro Met
195 200 205

Gln Ile Glu His Ile Val Pro Leu Ala Ser Gly Gly Ser Asn Arg Val

210 215 220

Ser Asn Leu Thr Leu Ala Cys Gly Pro Cys Asn Gln Lys Lys Ala Ala

225 230 235 240

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

245 250 255

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

260 265 270

Ser Thr Arg Trp Val Leu Phe Asn Thr Leu Lys Ala Thr Gly Leu Pro

275 280 285

Val Glu Val Ala Ser Gly Gly Arg Thr Lys Phe Asn Arg Thr Ala Leu

290 295 300

Gly Val Pro Lys Ser His Ala Leu Asp Ala Ala Cys Val Gly Glu Val

305 310 315 320

Lys Ala Ile Ser Gly Trp Asp Arg Gln Thr Leu Ala Ile Lys Cys Val

325 330 335

Gly Arg Gly Ala Tyr Gln Arg Thr Arg Leu Asn Ala Gly Gly Gly Val

340 345 350

Arg Gly Tyr Leu Met Arg Gln Lys Arg Val His Gly Phe Ala Thr Gly

355 360 365

Asp Met Val Arg Ala Val Ile Ala Ser Gly Lys Asn Ala Gly Thr His

370 375 380

Ser Gly Arg Val Ala Val Arg Lys Thr Gly Ser Phe Ala Ile Ala Thr

385 390 395 400

Pro Thr Gly Lys Leu Asp Gly Val Ser Trp Arg His Leu Ser Met Val

405 410 415

Gln Arg Ala Asp Gly Tyr Gly Tyr Ser Ile Glu Arg Thr His

420 425 430

<210> 383

<211> 487

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-337 effector

<400> 383

Met Ser Lys Thr Asn Tyr Val Leu Val Val Asp Thr Asn Lys His Pro
1 5 10 15

Leu Ser Pro Cys Lys Pro Gly Val Ala Arg Ser Leu Leu Lys Ala Gly
20 25 30

Lys Ala Ala Val Phe Arg Arg Tyr Thr Phe Thr Ile Ile Leu Lys Lys
35 40 45

Glu Val Glu Gly Asp Ile Leu Lys Ser Gln Ile Lys Ile Asp Pro Gly
50 55 60

Ser Lys Thr Thr Gly Leu Ala Leu Val Gln Asn Gly Val Val Ile Trp
65 70 75 80

Ala Ala Glu Leu Gln His Arg Gly Gln Leu Ile Lys Gln Ser Leu Asp
85 90 95

Asn Arg Arg Ser Leu Arg Arg Asn Arg Arg Asn Arg Lys Thr Arg Tyr
100 105 110

Arg Gln Pro Arg Phe Leu Asn Arg Val Lys Ser Lys Pro Lys Gly Trp
115 120 125

Leu Ala Pro Ser Leu Met His Arg Val Glu Asn Val Ser Thr Trp Val
130 135 140

Asn Lys Leu Ile Lys Phe Ser Ala Val Asp Ser Val Met Met Glu Leu
145 150 155 160

Val Arg Phe Asp Thr Gln Lys Met Thr Asn Pro Asp Val Ser Gly Val
165 170 175

Gln Tyr Gln Gln Gly Glu Leu Thr Gly Tyr Glu Val Arg Glu Tyr Leu
180 185 190

Leu Glu Lys Phe Asp Arg Thr Cys Val Tyr Cys Gln Ala Lys Asn Val
195 200 205

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

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

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

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

Ile Asn Ile Asn Pro Thr Lys Leu Asn Pro Val Glu Thr Gln Ile Val
435 440 445
Lys Gly Arg Thr Ala Ala Asn Pro Thr Gln Leu Asn Leu Phe Asp Ser

450 455 460

Ser Ile Phe Ala Val Glu Ser Ser Glu Ser Lys Ile His Lys Lys Ile

465 470 475 480

Val Glu His Thr Ser Glu Leu

485

<210> 384

<211> 428

<212> PRT

<213> Unknown

<220

><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-338 effector

<400> 384

Met Ser Lys Val Phe Val Leu Asp Thr Asn Lys Gln Pro Leu Asn Pro

1 5 10 15

Ile His Pro Gly Arg Ala Arg Met Leu Leu Ser Gln Arg Lys Ala Ala

20 25 30

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

35 40 45

Asn Pro Asp Ile Glu Pro Leu Arg Ile Lys Ile Asp Pro Gly Ala Lys

50 55 60

Thr Thr Gly Leu Ala Leu Val Asn Asp Ser Thr Gly Glu Val Val Trp

65 70 75 80

Ile Ala Glu Leu Gln His Arg Gly Phe Gln Ile Arg Asp Ala Leu Thr

85 90 95

Ser Arg Arg Gln Leu Arg Lys Ser Arg Arg Ser Arg Lys Thr Arg Tyr

100 105 110

Arg Lys Pro Arg Gly Leu Asn Arg Thr Arg Pro Thr Gly Trp Leu Pro

115 120 125

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

130 135 140

Leu Ser Ser Leu Cys Gln Ile Asn Ala Ile Ser Gln Glu Leu Val Arg
145 150 155 160
Phe Asp Thr Gln Gln Met Glu Asn Pro Glu Ile Ser Gly Ile Ala Tyr
165 170 175

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

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

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

Thr Gly Asp Ile Val Lys Ala Val Val Thr Ser Gly Lys Lys Val Gly
370 375 380
Thr His Gln Gly Arg Val Ala Thr Arg Ala Thr Gly Arg Phe Asn Ile

385 390 395 400

Ser Thr Thr Asp Gly Leu Val Gln Gly Ile Ser His Lys Tyr Cys Lys

405 410 415

His Ile His Lys Lys Asp Gly Tyr Ala Tyr Val Ala

420 425

<210> 385

<211

> 428

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-339 effector

<400> 385

Met Ser Lys Val Phe Val Leu Asp Thr Asn Lys Gln Pro Leu Asn Pro

1 5 10 15

Ile His Ser Gly Arg Ala Arg Met Leu Leu Ser Gln Gly Lys Ala Ala

20 25 30

Val Phe Arg Gly Phe Pro Phe Thr Leu Ile Leu Lys Glu Glu Val Ser

35 40 45

Ser Pro Asp Val Lys Pro Leu Arg Ile Lys Ile Asp Pro Gly Ala Lys

50 55 60

Thr Thr Gly Leu Ala Leu Val Asn Asp Lys Thr Gly Glu Val Val Trp

65 70 75 80

Val Ala Glu Leu Gln His Arg Asp Phe Gln Ile Arg Asp Ala Leu Thr

85 90 95

Ser Arg Arg Gln Leu Arg Arg Phe Arg Arg Ser Arg Lys Thr Arg Tyr

100 105 110

Arg Lys Pro Arg Phe Leu Asn Arg Thr Arg Pro Lys Gly Trp Leu Pro

115 120 125

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

130 135 140

Leu Ser Ser Leu Cys Gln Ile Asn Ala Ile Ser Gln Glu Leu Val Arg
145 150 155 160
Phe Asp Thr Gln Gln Met Glu Asn Pro Glu Ile Ser Gly Thr Gly Tyr

165 170 175
Gln Gln Gly Thr Leu Ala Gly Tyr Glu Ile Arg Glu Phe Leu Leu Glu
180 185 190
Lys Trp Asn Arg Thr Cys Ala Tyr Cys Gly Ala Lys Asp Thr Lys Leu
195 200 205
Glu Ile Glu His Ile Gln Pro Arg Ser Lys Gly Gly Ser Asn Arg Val
210 215 220
Ser Asn Leu Cys Leu Ala Cys Val Pro Cys Asn Arg Glu Lys Gly Asn

225 230 235 240
Gln Asp Ile Lys Asp Phe Leu Lys Gly Lys Pro Asp Leu Leu Lys Arg
245 250 255
Ile Leu Gly Gln Ala Lys Arg Pro Leu Ala Asp Thr Ser Ala Val Asn
260 265 270
Ala Thr Arg Trp Asn Leu Tyr Asp Asn Leu Arg Gln Thr Ser Leu Pro
275 280 285
Val Glu Val Gly Thr Gly Gly Leu Thr Lys Tyr Asn Arg Thr Ile Arg

290 295 300
Gly Leu Asp Lys Thr His Tyr Trp Asp Ala Ala Cys Val Gly Ala Ser
305 310 315 320
Thr Pro Glu Arg Leu Ile Thr Ser Gly Ile Lys Pro Leu Leu Ile Ser
325 330 335
Ala Lys Gly His Gly Thr Arg Gln Gln Cys Arg Thr Asn Lys Leu Gly
340 345 350
Phe Pro Val Arg Tyr Cys Ser Arg Thr Lys Phe His Lys Gly Phe Gln

355 360 365
Thr Gly Asp Ile Val Lys Ala Val Val Thr Ser Gly Lys Lys Val Gly
370 375 380
Thr Tyr Val Gly Arg Val Ala Thr Arg Ala Thr Leu Arg Phe Asn Ile

385 390 395 400

Ser Thr Lys Asp Gly Leu Val Gln Gly Ile Ser His Lys Tyr Cys Lys

405 410 415

His Ile His Lys Lys Asp Gly Tyr Ala Tyr Ala Tyr

420 425

<210> 386

<211> 427

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-340 effector

<400> 386

Met Ser Lys Val Phe Val Leu Asp Thr Asn Lys Gln Pro Leu Asn Ser

1 5 10 15

Ile His Pro Gly Arg Ala Arg Met Leu Leu Ser Gln Gly Lys Ala Ala

20 25 30

Ile Phe Arg Gln Tyr Pro Phe Thr Leu Ile Leu Lys Lys Glu Val Leu

35 40 45

Thr Pro Lys Val Glu Ser Leu Arg Val Lys Ile Asp Leu Gly Ala Lys

50 55 60

Ser Thr Gly Leu Ala Ile Val Asn Asp Ser Thr Gly Glu Val Val Trp

65 70 75 80

Val Ala Glu Leu Gln His Arg Gly Phe Gln Ile Arg Asp Ala Leu Thr

85 90 95

Ser Arg Arg Gln Leu Arg Arg Ser Arg Arg Arg Arg Lys Thr Arg Tyr

100 105 110

Arg Lys Pro Arg Phe Leu Asn Arg Thr Arg Pro Lys Gly Trp Leu Pro

115 120 125

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

130 135 140

Leu Ser Ser Leu Cys Gln Ile Thr Ala Ile Ser Gln Glu Leu Val Arg
145 150 155 160

Phe Asp Thr Gln Gln Met Gln Asp Ala Asp Ile Ser Gly Ile Gly Tyr
165 170 175
Gln Gln Gly Thr Leu Ala Gly Tyr Glu Ile Arg Glu Phe Leu Leu Glu
180 185 190
Lys Trp Lys Arg Thr Cys Ala Tyr Cys Gly Ala Lys Asp Thr Arg Leu
195 200 205
Glu Ile Glu His Ile Lys Pro Arg Ser Lys Gly Gly Ser Asn Arg Val
210 215 220

Ser Asn Leu Cys Leu Ala Cys Val Pro Cys Asn Gln Lys Lys Gly Asn
225 230 235 240
Gln Asp Ile Lys Asp Phe Leu Lys Gly Lys Pro Asp Leu Leu Lys Arg
245 250 255
Ile Leu Thr Gln Ala Lys Arg Pro Leu Ala Asp Thr Ala Ala Val Asn
260 265 270
Ala Thr Arg Trp Asn Leu Tyr Glu Asn Leu Lys Lys Thr Gly Leu Pro
275 280 285

Val Glu Val Gly Thr Gly Gly Arg Thr Lys Tyr Asn Arg Thr Asn Arg
290 295 300
Gly Leu Glu Lys Thr His His Trp Asp Ala Ala Cys Val Gly Ala Ser
305 310 315 320
Thr Pro Lys Gln Leu Ile Thr Thr Gly Val Lys Pro Leu Leu Ile Ala
325 330 335
Ala Ser Cys His Gly Thr Arg Gln Gln Cys Arg Thr Asn Lys Phe Gly
340 345 350

Phe Pro Val Arg Tyr Cys Ser Arg Thr Lys Phe Tyr Lys Gly Phe Gln
355 360 365
Thr Val Asp Ile Val Lys Ala Val Val Thr Ser Gly Lys Lys Val Gly
370 375 380
Thr Tyr Val Gly Arg Val Ala Thr Arg Ala Thr Gly Ser Phe Asn Ile

385 390 395 400

Ser Thr Ala Gly Gly Leu Ile Gln Gly Ile Ser His Lys Tyr Cys Thr

405 410 415

His Ile His Arg Lys Asp Gly Tyr Ala Tyr Ala

420 425

<210> 387

<211> 242

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-341 effector

<400> 387

Met Ser Lys Val Phe Val Leu Asp Thr Asn Lys Gln Pro Leu Asn Ser

1 5 10 15

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

20 25 30

Ile Phe Arg Gln Tyr Pro Phe Thr Leu Ile Leu Lys Lys Glu Val Leu

35 40 45

Thr Pro Lys Ile Glu Pro Leu Arg Val Lys Ile Asp Pro Gly Ala Lys

50 55 60

Ser Thr Gly Leu Ala Ile Val Asn Asp Ser Thr Gly Glu Val Val Trp

65 70 75 80

Val Ala Glu Leu Gln His Arg Gly Phe Gln Val Arg Asp Ala Leu Thr

85 90 95

Ser Arg Arg Gln Leu Arg Arg Ser Arg Arg Arg Arg Lys Thr Arg Tyr

100 105 110

Arg Lys Pro Arg Phe Leu Asn Arg Thr Arg Pro Lys Gly Trp Leu Pro

115 120 125

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

130 135 140

Leu Ser Ser Leu Cys Gln Ile Asn Ala Ile Ser Gln Glu Leu Val Arg
145 150 155 160

Phe Asp Thr Gln Gln Met Glu Asp Ser Glu Ile Ser Gly Ile Gly Tyr
165 170 175
Gln Gln Gly Thr Leu Ala Gly Tyr Glu Ile Arg Glu Phe Leu Leu Glu
180 185 190
Lys Trp Lys Arg Thr Cys Ala Tyr Cys Gly Ala Lys Asp Thr Arg Leu
195 200 205
Glu Ile Glu His Ile Lys Pro Arg Ser Lys Gly Gly Ser Asn Arg Val
210 215 220

Ser Asn Leu Cys Leu Ala Cys Val Pro Cys Asn Arg Lys Lys Gly Asn
225 230 235 240
Gln Asp

<210> 388
<211> 439
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-342 effector
<400> 388
Met Ser Lys Val Phe Val Val Asp Ala Asn Lys His Pro Leu Asn Pro
1 5 10 15
Val His Pro Gly Tyr Ala Arg Leu Leu Leu Lys Gln Gly Lys Ala Ala

20 25 30
Val Leu Arg His Tyr Pro Phe Val Leu Ile Leu His Ala Glu Val Glu
35 40 45
Met Pro Gln Leu Glu Pro Leu Arg Val Lys Leu Asp Pro Gly Ser Lys
50 55 60
Thr Thr Gly Leu Ala Leu Val Lys Asp Ala Thr Gly Glu Val Ile Phe

65 70 75 80

Ala Ala Glu Ile Thr His Arg Gly Ala Glu Ile Lys His Ala Leu Asp

85 90 95

Gly Arg Arg Ser Val Arg Arg Gly Arg Arg Gln Arg Asp Thr Arg Tyr

100 105 110

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

115 120 125

Pro Ser Leu Glu Ser Arg Val Cys Asn Val Val Thr Trp Val Lys Arg

130 135 140

Leu Arg Arg Leu Cys Pro Leu Ala Ala Ile Ser Gln Glu Leu Val Arg

145 150 155 160

Phe Asp Leu Gln Ala Met Glu Asn Pro Glu Ile Ala Gly Ile Ala Tyr

165 170 175

Gln Gln Gly Thr Leu Ala Gly Tyr Glu Ala Arg Glu Tyr Leu Leu Glu

180 185 190

Lys Trp Gly Arg Lys Cys Cys Tyr Cys Gly Ala Thr Arg Leu Pro Leu

195 200 205

Gln Ile Glu His Ile Gln Cys Arg Ala Lys Gly Gly Ser Asp Arg Ile

210 215 220

Ser Asn Leu Cys Leu Ala Cys Gly Pro Cys Asn Leu Lys Lys Gly Thr

225 230 235 240

Val Asp Ile Gln Val Phe Leu Ala Lys Lys Pro Asp Leu Arg Lys Arg

245 250 255

Ile Leu Ala Arg Ala Pro Leu Ala Asp Ala Ala Ala Val Asn Ser Thr

260 265 270

Arg Trp Ala Leu Tyr Glu Arg Leu Gln Ala Leu Gly Leu Pro Val Glu

275 280 285

Cys Gly Ser Gly Gly Arg Thr Lys Phe Asn Arg Ala Ser Arg Gly Leu

290 295 300

Glu Lys Thr His Trp His Asp Ala Ala Cys Val Gly Ala Ser Thr Pro

305 310 315 320

Glu Ile Leu His Leu Gln Gly Ile Val Pro Leu Leu Ile Thr Ala Gln

325 330 335

Gly Tyr Gly Cys Arg Gln Met Cys Asn Val Asn Glu Ile Gly Phe Pro

340 345 350

Cys Ser Lys Pro Lys Gly Ala Lys Lys Val Lys Gly Phe Gln Thr Gly

355 360 365

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

370 375 380

Met Gly Arg Val Leu Val Arg Ala Thr Gly Ser Phe Asp Ile Arg Thr

385 390 395 400

Lys Asp Gly Arg Val Gln Gly Ile Ser His Arg Phe Cys Thr Pro Ile

405 410 415

His Arg Arg Asp Gly Tyr Ser Tyr Lys Gln Gly Ala Asp His Ala Ala

420 425 430

His Pro Thr Gln Ser Thr Arg

435

<210> 389

<211> 40

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-343 effector

<400> 389

Met Ser Asn Asp Val Leu Val Leu Asp Thr Arg Glu Asn Leu Leu Thr

1 5 10 15

Pro Cys Lys Pro Ser Met Ala Arg Lys Leu Leu Asn Ala Gly Lys Ala

20 25 30

Ala Val Phe Arg Arg Phe Pro Phe

35 40

<210> 390

<211> 104

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-344 effector

<400> 390

Met Ser Asn Asp Val Leu Val Leu Asp Thr Arg Glu Asn Leu Leu Thr

1 5 10 15

Pro Cys Lys Pro Ser Met Ala Arg Lys Leu Leu Asn Ala Gly Lys Ala

20 25 30

Ala Val Phe Arg Arg Phe Pro Phe Thr Ile Ile Leu Lys Lys Glu Val

35 40 45

Asp Ala Thr Pro Asn Pro Ile Glu Leu Lys Leu Asp Pro Gly Ala Lys

50 55 60

Thr Thr Gly Ile Ala Leu Lys Gln Gly Asp Lys Ile Ile Phe Gly Ala

65 70 75 80

Glu Leu Thr His Arg Gly Gln Ala Ile Lys Ala Ser Leu Glu Ser Arg

85 90 95

Arg Ser Leu Arg Arg Ser Arg Arg

100

<210> 391

<211> 104

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-345 effector

<400> 391

Met Ser Asn Asp Val Leu Val Leu Asp Thr Arg Glu Asn Leu Leu Thr

1 5 10 15

Pro Cys Lys Pro Ser Met Ala Arg Lys Leu Leu Asn Ala Gly Lys Ala

20 25 30

Ala Val Phe Arg Arg Phe Pro Phe Thr Ile Ile Leu Lys Lys Glu Val

35 40 45

Asp Ala Thr Pro Asn Pro Ile Glu Leu Lys Leu Asp Pro Gly Ser Lys

50 55 60

Thr Thr Gly Ile Ala Leu Lys Gln Gly Asp Lys Ile Ile Phe Gly Ala

65 70 75 80

Glu Leu Thr His Arg Gly Gln Ala Ile Lys Ala Ser Leu Glu Ser Arg

85 90 95

Arg Ser Leu Arg Arg Ser Arg Arg

100

<210> 392

<211> 423

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-346 effector

<400> 392

Met Ser Asn Phe Ile Phe Val Leu Asp Ala Asn Lys Lys Ile Leu Thr

1 5 10 15

Pro Cys Lys Pro Ser Met Ala His Lys Leu Leu Thr Ala Gly Lys Ala

20 25 30

Ile Val Phe Arg Arg Phe Pro Phe Thr Ile Ile Leu Lys Lys Thr Val

35 40 45

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

50 55 60

Thr Thr Gly Leu Ala Leu Leu Glu Gly Glu Lys Val Ile Phe Gly Ala

65 70 75 80

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

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

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

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

325 330 335

Gly Thr Arg Gln Met Cys Arg Thr Asp Lys Phe Gly Phe Pro Ser Arg

340 345 350

Tyr Val Pro Arg Asn Lys Phe Val Lys Gly Phe Gln Thr Gly Asp Ile

355 360 365

Val Lys Ala Val Val Thr Ser Gly Lys Lys Ile Gly Glu Tyr Val Gly

370 375 380

Arg Val Ala Val Arg Ser Thr Gly Ser Phe Asn Ile Ser Ala Ser Glu

385 390 395 400

Leu Val Gln Gly Ile Ser His Lys Tyr Cys Lys Thr Val His His Lys

405 410 415

Asp Gly Tyr Ser Tyr Ser Phe

420

<210> 393

<211> 423

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-347 effector

<400> 393

Met Ser Asn Phe Ile Phe Val Leu Asp Ala Asn Lys Lys Ile Leu Thr

1 5 10 15

Pro Cys Lys Pro Ser Met Ala His Lys Leu Leu Thr Ala Gly Lys Ala

20 25 30

Ile Val Phe Arg Arg Phe Pro Phe Thr Ile Ile Leu Lys Lys Thr Val

35 40 45

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

50 55 60

Thr Thr Gly Leu Ala Leu Leu Glu Gly Glu Lys Val Ile Phe Gly Ala

65 70 75 80

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

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

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

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

325 330 335

Gly Thr Arg Gln Met Cys Arg Thr Asp Lys Phe Gly Phe Pro Ser Arg

340 345 350

Tyr Val Pro Arg Asn Lys Phe Val Lys Gly Phe Gln Thr Gly Asp Ile

355 360 365

Val Lys Ala Val Val Thr Ser Gly Lys Lys Ile Gly Glu Tyr Val Gly

370 375 380

Arg Val Ala Val Arg Ser Thr Gly Ser Phe Asn Ile Ser Ala Ser Glu

385 390 395 400

Leu Val Gln Gly Ile Ser His Lys Tyr Cys Lys Thr Val His His Lys

405 410 415

Asp Gly Tyr Ser Tyr Ser Phe

420

<210> 394

<211> 205

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-348 effector

<400> 394

Met Ser Asn Phe Ile Phe Val Leu Asp Ala Ser Leu Lys Pro Leu Thr

1 5 10 15

Pro Cys Lys Pro Ser Ile Ala His Lys Leu Leu Thr Ala Gly Lys Ala

20 25 30

Ala Val Phe Arg Arg Phe Pro Phe Thr Ile Ile Leu Lys Lys Thr Val

35 40 45

Thr Ala Thr Ile Glu Ser Ile Thr Leu Lys Leu Asp Pro Gly Ser Lys

50 55 60

Thr Thr Gly Ile Ala Leu Leu Gln Gly Glu Lys Val Ile Phe Gly Ala

65 70 75 80

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

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

195 200 205
<210> 395
<211> 167
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-349 effector
<400> 395
Met Ser Asn Phe Ile Phe Val Leu Asp Thr Lys Gly Arg Ser Leu Ser
1 5 10 15
Pro Cys Gln Pro Gly Val Gly Arg Ser Leu Leu Lys Ala Gly Lys Ala
20 25 30

Ser Val Phe Arg Lys Phe Pro Phe Thr Ile Ile Leu Asn Lys Gln Val
35 40 45
Asp Ala Ser Pro Glu Pro Leu Glu Leu Lys Leu Asp Pro Gly Ser Lys

50 55 60

Thr Thr Gly Ile Ala Ile Lys Gln Gly Asp Lys Val Ile Phe Gly Ala
65 70 75 80

Glu Leu Gln His Arg Gly Gln Gln Ile Lys Glu Ala Leu Leu Ser Arg
85 90 95

Arg Gln Leu Arg Arg Thr Arg Arg Asn Arg Lys Thr Arg Tyr Arg Leu
100 105 110

Ala Arg Phe Leu Asn Arg Thr Arg Leu Asp Asp Trp Leu Ala Pro Ser
115 120 125

Leu Gln His Arg Val Glu Thr Thr Leu Thr Trp Gly Glu Gln Val Asp
130 135 140

Glu Ile Cys Thr His Tyr Gln His Cys Ser Arg Ala Arg Ala Val Arg
145 150 155 160

Phe Ala Thr His Ala Lys Pro
165

<210> 396

<211> 424

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-350 effector

<400> 396

Met Ser Asn Phe Ile Phe Val Leu Asp Thr Asn Lys Gln Pro Leu Thr
1 5 10 15

Pro Cys Lys Pro Ser Met Ala Arg Lys Leu Leu Val Ala Gly Lys Ala
20 25 30

Ala Val Phe Arg Arg Tyr Pro Phe Thr Ile Ile Leu Lys Lys Ala Val
35 40 45

Leu Leu Ser Pro Lys Ser Ile Ile Leu Lys Ile Asp Pro Gly Ser Lys
50 55 60

Thr Thr Gly Ile Ala Leu Val Gln Gly Asp Arg Val Ile Trp Gly Ala
65 70 75 80
Glu Leu Thr His Arg Gly Gln Lys Ile Lys Ser Ser Leu Glu Ser Arg
85 90 95

Arg Ser Leu Arg Arg Ser Arg Arg Ser Arg His Thr Arg Tyr Arg Gln
100 105 110
Ala Arg Phe Leu Asn Arg Thr Arg Pro Lys Gly Trp Leu Val Pro Ser
115 120 125
Leu Gln His Arg Val Glu Thr Thr Leu Thr Trp Val Lys Lys Leu Ile
130 135 140
Lys Phe Val Pro Ile Thr Gly Ile Ser Gln Glu Leu Val Arg Phe Asp
145 150 155 160

Leu Gln Lys Ile Glu Asn Pro Glu Ile Ser Gly Ile Glu Tyr Gln Gln
165 170 175
Gly Glu Leu Gln Gly Tyr Glu Ile Arg Glu Tyr Leu Leu Glu Lys Trp
180 185 190
Gly Arg Lys Cys Ala Tyr Cys Gly Val Glu Asn Val Pro Leu Gln Val
195 200 205
Glu His Ile His Pro Lys Ala Gln Gly Gly Thr Ser Arg Val Ala Asn
210 215 220

Leu Cys Leu Ala Cys Glu Pro Cys Asn Thr Lys Lys Gly Thr Gln Asp
225 230 235 240
Ile Lys Glu Phe Leu Ala Lys Lys Pro Asp Ile Leu Lys Ile Ile Leu
245 250 255
Ala Gln Ala Lys Cys Pro Leu Lys Asp Ala Ala Ala Val Asn Ser Thr
260 265 270
Arg Trp Ala Leu Phe Asn Thr Leu Lys Ala Thr Gly Leu Pro Leu Ala
275 280 285

Thr Gly Ser Gly Gly Gln Thr Lys Phe Asn Arg His Trp Leu Asn Leu
290 295 300
Pro Lys Ser His Trp Ile Asp Ala Ala Cys Val Gly Lys Val Glu Ser

305 310 315 320

Leu Lys Val Leu Thr Ser Gln Pro Leu Leu Ile Lys Ala Thr Gly Tyr

325 330 335

Gly Thr Arg Gln Met Cys Gly Thr Asn Lys Tyr Gly Phe Pro Thr Arg

340 345 350

His Arg Ser Arg Phe Gln Val His Lys Gly Phe Gln Thr Gly Asp Ile

355 360 365

Val Lys Ala Val Val Thr Ser Gly Lys Lys Ile Gly Ile Tyr Thr Gly

370 375 380

Arg Ile Leu Cys Arg Ala Ser Gly Ser Phe Asp Ile Ala Thr Lys Thr

385 390 395 400

Gly Arg Val Thr Gly Ile Ser His Lys Tyr Cys Leu Pro Ile His Gln

405 410 415

Lys Asp Gly Tyr Gln Tyr Ala Leu

420

<210> 397

<211> 257

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-351 effector

<400> 397

Met Ser Asn Phe Ile Phe Val Val Asp Thr Asn Lys Lys Pro Leu Thr

1 5 10 15

Pro Cys Lys Ser Ser Met Ala Arg Lys Leu Leu Thr Ala Gly Lys Ala

20 25 30

Ala Ile Phe Arg Arg Phe Pro Cys Thr Ile Ile Leu Lys Lys Ala Val

35 40 45

Thr Ala Thr Ile Glu Ser Ile Thr Leu Lys Leu Asp Pro Gly Ser Lys

50 55 60

Thr Thr Gly Ile Ala Leu Leu Gln Gly Glu Lys Val Ile Phe Gly Ala
65 70 75 80
Glu Leu Thr His Arg Gly Gln Thr Ile Lys Ala Ser Leu Glu Ser Arg
85 90 95

Arg Ser Leu Arg Arg Gly Arg Arg Asn Arg His Thr Arg Tyr Arg Gln
100 105 110
Ala Arg Phe Leu Asn Arg Thr Arg Lys Lys Gly Trp Leu Ala Pro Ser
115 120 125
Leu Gln His Arg Val Glu Thr Thr Leu Thr Trp Val Glu Lys Leu Arg
130 135 140
Arg Leu Ala Pro Ile Gly Leu Ile Val Gln Glu Leu Val Arg Phe Asp
145 150 155 160

Leu Gln Gln Leu Glu Asn Pro Glu Ile Ser Ala Ile Glu Tyr His Gln
165 170 175
Gly Glu Leu Gln Gly Tyr Glu Val Arg Gln Tyr Leu Leu Asn Lys Trp
180 185 190
Asn Arg Lys Cys Ala Tyr Cys Asp Ala Glu Asn Val Pro Leu Gln Val
195 200 205
Glu His Ile His Pro Lys Ser Gln Gly Gly Ser Asn Arg Ile Ser Asn
210 215 220

Leu Cys Leu Ala Cys Gln Lys Cys Asn Gln Lys Lys Gly Thr Gln Asn
225 230 235 240
Ile Glu Gln Phe Leu Ala Lys Lys Pro Asp Ile Leu Ser Arg Ile Leu
245 250 255
Thr

<210> 398
<211> 423
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-352 effector

<400> 398

Met Ser Asn Phe Ile Phe Val Val Asp Thr Asn Lys Lys Pro Leu Thr

1 5 10 15

Pro Cys Lys Ser Ser Met Ala Arg Lys Leu Leu Thr Ala Gly Lys Ala

20 25 30

Ala Ile Phe Arg Arg Phe Pro Cys Thr Ile Ile Leu Lys Lys Ala Val

35 40 45

Thr Ala Thr Ile Glu Ser Ile Thr Leu Lys Leu Asp Pro Gly Ser Lys

50 55 60

Thr Thr Gly Ile Ala Leu Leu Gln Gly Glu Lys Val Ile Phe Gly Ala

65 70 75 80

Glu Leu Thr His Arg Gly Gln Thr Ile Lys Ala Ser Leu Glu Ser Arg

85 90 95

Arg Ser Leu Arg Arg Gly Arg Arg Asn Arg His Thr Arg Tyr Arg Gln

100 105 110

Ala Arg Phe Leu Asn Arg Thr Arg Lys Lys Gly Trp Leu Ala Pro Ser

115 120 125

Leu Gln His Arg Val Glu Thr Thr Leu Thr Trp Val Glu Lys Leu Arg

130 135 140

Arg Leu Ala Pro Ile Gly Leu Ile Val Gln Glu Leu Val Arg Phe Asp

145 150 155 160

Leu Gln Gln Leu Glu Asn Pro Glu Ile Ser Ala Ile Glu Tyr His Gln

165 170 175

Gly Glu Leu Gln Gly Tyr Glu Val Arg Gln Tyr Leu Leu Asn Lys Trp

180 185 190

Asn Arg Lys Cys Ala Tyr Cys Asp Ala Glu Asn Val Pro Leu Gln Val

195 200 205

Glu His Ile His Pro Lys Ser Gln Gly Gly Ser Asn Arg Ile Ser Asn

210 215 220

Leu Cys Leu Ala Cys Gln Lys Cys Asn Gln Lys Lys Gly Thr Gln Asn
225 230 235 240
Ile Glu Gln Phe Leu Ala Lys Lys Pro Asp Ile Leu Ser Arg Ile Leu
245 250 255
Thr Gln Ser Lys Arg Pro Leu Lys Asp Ala Ala Ala Val Asn Ser Thr

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

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

385 390 395 400
Leu Val Gln Gly Ile Ser His Lys Tyr Cys Lys Ile Val His Lys Lys
405 410 415
Asp Gly Tyr Ser Tyr Ala Tyr
420

<210> 399
<211> 423
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-353 effector

<400> 399

Met Ser Asn Phe Ile Phe Val Val Asp Thr Asn Lys Lys Pro Leu Thr

1 5 10 15

Pro Cys Lys Ser Ser Met Ala Arg Lys Leu Leu Thr Ala Gly Lys Ala

20 25 30

Ala Ile Phe Arg Arg Phe Pro Cys Thr Ile Ile Leu Lys Lys Ala Val

35 40 45

Thr Ala Thr Ile Glu Ser Ile Thr Leu Lys Leu Asp Pro Gly Ser Lys

50 55 60

Thr Thr Gly Ile Ala Leu Leu Gln Gly Glu Lys Val Ile Phe Gly Ala

65 70 75 80

Glu Leu Thr His Arg Gly Gln Thr Ile Lys Ala Ser Leu Glu Ser Arg

85 90 95

Arg Ser Leu Arg Arg Gly Arg Arg Asn Arg His Thr Arg Tyr Arg Gln

100 105 110

Ala Arg Phe Leu Asn Arg Thr Arg Lys Lys Gly Trp Leu Ala Pro Ser

115 120 125

Leu Gln His Arg Val Glu Thr Thr Leu Thr Trp Val Glu Lys Leu Arg

130 135 140

Arg Leu Ala Pro Ile Gly Leu Ile Val Gln Glu Leu Val Arg Phe Asp

145 150 155 160

Leu Gln Gln Leu Glu Asn Pro Glu Ile Ser Ala Ile Glu Tyr His Gln

165 170 175

Gly Glu Leu Gln Gly Tyr Glu Val Arg Gln Tyr Leu Leu Asn Lys Trp

180 185 190

Asn Arg Lys Cys Ala Tyr Cys Asp Ala Glu Asn Val Pro Leu Gln Val

195 200 205

Glu His Ile His Pro Lys Ser Gln Gly Gly Ser Asn Arg Ile Ser Asn

210 215 220

Leu Cys Leu Ala Cys Gln Lys Cys Asn Gln Lys Lys Gly Thr Gln Asn
225 230 235 240
Ile Glu Gln Phe Leu Ala Lys Lys Pro Asp Ile Leu Ser Arg Ile Leu
245 250 255
Thr Gln Ser Lys Arg Pro Leu Lys Asp Ala Ala Ala Val Asn Ser Thr

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

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

385 390 395 400
Leu Val Gln Gly Ile Ser His Lys Tyr Cys Lys Ile Val His Lys Lys
405 410 415
Asp Gly Tyr Ser Tyr Ala Tyr
420

<210> 400
<211> 114
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-354 effector

<400> 400

Met Ser Asn Phe Ile Leu Val Leu Asp Thr Lys Gly Arg Pro Leu Ser

1 5 10 15

Pro Cys Gln Pro Gly Val Gly Arg Ser Leu Leu Lys Ala Gly Lys Ala

20 25 30

Ser Val Phe Arg Gln Phe Pro Phe Thr Val Ile Leu Asn Lys Gln Val

35 40 45

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

50 55 60

Thr Thr Gly Ile Ala Ile Leu Gln Gly Asp Lys Ala Ile Phe Gly Ala

65 70 75 80

Glu Leu Gln His Arg Gly Gln Gln Ile Lys Asp Ala Leu Leu Ser Arg

85 90 95

Arg Gln Leu Arg Arg Gly Arg Arg Asn Arg Lys Thr Arg Tyr Arg Gln

100 105 110

Ala Arg

<210> 401

<211> 424

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220

><223> Description: MG35-355 effector

<400> 401

Met Ser Asn Phe Val Phe Val Leu Asp Ser His Lys Gln Pro Leu Asn

1 5 10 15

Pro Ile Arg Pro Gly Met Ala Arg Lys Leu Leu Thr Thr Gly Lys Ala

20 25 30

Ala Val Phe Lys Arg Tyr Pro Phe Thr Ile Ile Leu Lys Val Glu Ile

35 40 45

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

50 55 60

Thr Thr Gly Ile Ala Leu Val Gln Gly Lys Asn Val Ile Phe Gly Ala

65 70 75 80

Glu Leu Thr His Arg Gly Gln Ser Ile Lys Ala Ser Leu Glu Ser Arg

85 90 95

Arg Ser Leu Arg Arg Gly Arg Arg Ser Arg His Thr Arg Tyr Arg Lys

100 105 110

Ala Arg Phe Leu Asn Arg Thr Arg Ser Lys Gly Trp Leu Ala Pro Ser

115 120 125

Leu Gln His Arg Val Glu Thr Thr Leu Thr Trp Val Thr Arg Leu Met

130 135 140

Lys Val Ala Pro Ile Ser Phe Ile Val Gln Glu Leu Val Arg Phe Asp

145 150 155 160

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

165 170 175

Gly Ile Leu Cys Gly Tyr Glu Ile Arg Glu Tyr Leu Leu Asn Lys Trp

180 185 190

Asp Arg Lys Cys Ala Tyr Cys Gly Val Ala Asp Thr Pro Leu Gln Ile

195 200 205

Glu His Ile His Pro Lys Ala Lys Gly Gly Ser Asp Arg Ile Ser Asn

210 215 220

Leu Cys Leu Ala Cys Glu Asn Cys Asn Thr Arg Lys Gly Thr Gln Asp

225 230 235 240

Ile Glu Gln Phe Leu Ser Lys Lys Pro Asp Val Leu Lys Lys Ile Leu

245 250 255

Ser Gln Ala Lys Arg Pro Leu Lys Asp Ala Thr Val Val Asn Ser Thr

260 265 270

Arg Trp Ala Leu Phe Asn Arg Leu Arg Met Thr Gly Leu Pro Val Ser

275 280 285

Thr Gly Ser Gly Gly Leu Thr Lys Phe Asn Arg Thr Arg Leu Gln Leu

290 295 300

Pro Lys Ser His Trp Leu Asp Ala Ala Cys Val Gly Lys Val Glu Glu

305 310 315 320

Leu Lys Val Leu Thr Phe Gln Pro Leu Leu Ile Lys Ala Thr Gly His

325 330 335

Gly Thr Arg Gln Met Cys Gly Thr Asn Lys Phe Gly Phe Pro Ile Arg

340 345 350

His Lys Ser Arg Lys Gln Ile His Phe Gly Phe Gln Thr Gly Asp Ile

355 360 365

Ile Asn Ala Thr Val Thr Ala Gly Lys Lys Val Gly Ser Tyr Val Gly

370 375 380

Arg Ile Leu Cys Arg Ala Ser Gly Ser Phe Asp Ile Ala Thr Met Lys

385 390 395 400

Gly Arg Val Ala Gly Ile Ser His Lys Tyr Cys Gln Ser Ile His Lys

405 410 415

Lys Asp Gly Tyr Ser Tyr Gly Val

420

<210> 402

<211> 424

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-356 effector

<400> 402

Met Ser Asn Phe Val Phe Val Leu Asp Ser His Lys Gln Pro Leu Asn

1 5 10 15

Pro Ile Arg Pro Gly Met Ala Arg Lys Leu Leu Thr Thr Gly Lys Ala

20 25 30

Ala Val Phe Lys Arg Tyr Pro Phe Thr Ile Ile Leu Lys Val Glu Ile

35 40 45

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

50 55 60

Thr Thr Gly Ile Ala Leu Val Gln Gly Lys Asn Val Ile Phe Gly Ala

65 70 75 80

Glu Leu Thr His Arg Gly Gln Ser Ile Lys Ala Ser Leu Glu Ser Arg

85 90 95

Arg Ser Leu Arg Arg Gly Arg Arg Ser Arg His Thr Arg Tyr Arg Lys

100 105 110

Ala Arg Phe Leu Asn Arg Thr Arg Ser Lys Gly Trp Leu Ala Pro Ser

115 120 125

Leu Gln His Arg Val Glu Thr Thr Leu Thr Trp Val Thr Arg Leu Met

130 135 140

Lys Val Ala Pro Ile Ser Phe Ile Val Gln Glu Leu Val Arg Phe Asp

145 150 155 160

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

165 170 175

Gly Ile Leu Cys Gly Tyr Glu Ile Arg Glu Tyr Leu Leu Asn Lys Trp

180 185 190

Asp Arg Lys Cys Ala Tyr Cys Gly Val Ala Asp Thr Pro Leu Gln Ile

195 200 205

Glu His Ile His Pro Lys Ala Lys Gly Gly Ser Asp Arg Ile Ser Asn

210 215 220

Leu Cys Leu Ala Cys Glu Asn Cys Asn Thr Arg Lys Gly Thr Gln Asp

225 230 235 240

Ile Glu Gln Phe Leu Ser Lys Lys Pro Asp Val Leu Lys Lys Ile Leu

245 250 255

Ser Gln Ala Lys Arg Pro Leu Lys Asp Ala Thr Val Val Asn Ser Thr

260 265 270

Arg Trp Ala Leu Phe Asn Arg Leu Arg Met Thr Gly Leu Pro Val Ser

275 280 285

Thr Gly Ser Gly Gly Leu Thr Lys Phe Asn Arg Thr Arg Leu Gln Leu

290 295 300

Pro Lys Ser His Trp Leu Asp Ala Ala Cys Val Gly Lys Val Glu Glu

305 310 315 320

Leu Lys Val Leu Thr Phe Gln Pro Leu Leu Ile Lys Ala Thr Gly His

325 330 335

Gly Thr Arg Gln Met Cys Gly Thr Asn Lys Phe Gly Phe Pro Ile Arg

340 345 350

His Lys Ser Arg Lys Gln Ile His Phe Gly Phe Gln Thr Gly Asp Ile

355 360 365

Ile Asn Ala Thr Val Thr Ala Gly Lys Lys Val Gly Ser Tyr Val Gly

370 375 380

Arg Ile Leu Cys Arg Ala Ser Gly Ser Phe Asp Ile Ala Thr Met Lys

385 390 395 400

Gly Arg Val Ala Gly Ile Ser His Lys Tyr Cys Gln Ser Ile His Lys

405 410 415

Lys Gly Gly Tyr Ser Asn Gly Val

420

<210> 403

<211> 197

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-357 effector

<400> 403

Met Ser Asn Phe Val Phe Val Leu Asp Thr Asp Arg Arg Pro Leu Asn

1 5 10 15

Leu Thr His Pro Gly Ala Ala Arg His Leu Leu Asn Thr Gly Lys Ala

20 25 30

Ala Val Phe Arg Arg Tyr Pro Phe Thr Ile Ile Leu Lys Glu Ala Cys
35 40 45
Pro Asp Val Pro Val Gln Asp Leu Glu Leu Lys Leu Asp Pro Gly Ser

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

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

180 185 190
Trp Asn Arg Arg Cys
195

<210> 404
<211> 301
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-358 effector
<400> 404
Met Ser Asn Phe Val Phe Val Leu Asp Thr Glu Lys Gln Pro Leu Asn

1 5 10 15

Pro Leu His Ser Gly Gln Ala Arg Arg Leu Leu Asn Thr Gly Lys Ala

20 25 30

Ala Val Phe Arg Lys Tyr Pro Phe Thr Ile Ile Leu Lys Val Ala Val

35 40 45

Thr Thr Ile Pro Lys Ser Ile Thr Leu Lys Ile Asp Pro Gly Ser Lys

50 55 60

Thr Thr Gly Ile Ala Leu Leu Gln Gly Glu Lys Val Ile Phe Gly Ala

65 70 75 80

Glu Leu Ala His Arg Gly Gln Val Ile Lys Ala Ser Leu Glu Ser Arg

85 90 95

Arg Ser Leu Arg Arg Gly Arg Arg Ser Arg His Thr Arg Tyr Arg Gln

100 105 110

Ala Arg Phe Leu Asn Arg Thr His Lys Glu Gly Arg Phe Leu Asn Arg

115 120 125

Thr Arg Lys Glu Gly Trp Leu Ala Pro Ser Leu Gln His Arg Val Glu

130 135 140

Thr Thr Leu Thr Trp Val Asn Lys Leu Arg Arg Leu Thr Pro Ile Asp

145 150 155 160

Ser Ile Val Gln Glu Leu Val Arg Phe Asp Leu Gln Gln Leu Glu Asn

165 170 175

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

180 185 190

Glu Val Arg Glu Tyr Leu Leu Lys Lys Trp Asn Arg Lys Cys Ala Tyr

195 200 205

Cys Gly Ile Glu Asn Val Pro Leu Gln Val Val His Ile Gln Pro Lys

210 215 220

Ala Lys Gly Gly Ser Asn Arg Ile Ser Asn Ile Cys Leu Ala Cys Lys

225 230 235 240

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

245 250 255

Thr Arg Asp Ser Ser Asn Val Ser His Gly Gln Ile Trp Leu Ala Ile
260 265 270
Ser Val Arg Pro Asp Gln Gln Val Cys Gln Arg Phe Ser Asn Arg Arg

275 280 285
His Cys Lys Ser Gly Arg Tyr Gln Gly Gln Glu Asn Arg
290 295 300
<210> 405
<211> 301
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-359 effector
<400> 405
Met Ser Asn Phe Val Phe Val Leu Asp Thr Glu Lys Gln Pro Leu Asn
1 5 10 15

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

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

130 135 140

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

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

Ser Val Arg Pro Asp Gln Gln Val Cys Gln Arg Phe Ser Asn Arg Arg
275 280 285
His Cys Lys Ser Gly Arg Tyr Gln Gly Gln Glu Asn Arg
290 295 300

<210> 406
<211> 200
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-360 effector
<400> 406
Met Ser Asn Phe Val Phe Val Leu Asp Thr Glu Lys Arg Pro Leu Asn

1 5 10 15

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

20 25 30

Ala Val Phe Arg Lys Tyr Pro Phe Thr Ile Ile Leu Lys Val Ala Val

35 40 45

Thr Thr Thr Pro Glu Ser Ile Thr Leu Lys Ile Asp Pro Gly Ser Lys

50 55 60

Thr Thr Gly Ile Ala Leu Val Gln Gly Gly Lys Val Ile Phe Gly Ala

65 70 75 80

Glu Leu Thr His Arg Gly Gln Ser Ile Ala Ala Ser Leu Asp Ser Arg

85 90 95

Arg Ser Leu Arg Arg Ser Arg Arg Asn Arg His Thr Arg Tyr Arg Gln

100 105 110

Ala Arg Phe Leu Asn Arg Thr Arg Lys Glu Gly Trp Leu Ala Pro Ser

115 120 125

Leu Gln His Arg Val Glu Thr Thr Leu Thr Trp Val Ile Lys Phe Ile

130 135 140

Lys Leu Ala Pro Ile Asp Ser Ile Val Gln Glu Leu Val Arg Phe Asp

145 150 155 160

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

165 170 175

Gly Glu Leu Gln Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Val Arg

180 185 190

Pro Val Ser Val Lys Thr Lys Ala

195 200

<210> 407

<211> 200

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-361 effector

<400> 407

Met Ser Asn Phe Val Phe Val Leu Asp Thr Glu Lys Arg Pro Leu Asn
1 5 10 15

Pro Val Gln Pro Gly Gln Ala Arg Arg Leu Leu Lys Thr Glu Lys Ala
20 25 30

Ala Val Phe Arg Lys Tyr Pro Phe Thr Ile Ile Leu Lys Val Ala Val

35 40 45

Thr Thr Thr Pro Glu Ser Ile Thr Leu Lys Ile Asp Pro Gly Ser Lys
50 55 60

Thr Thr Gly Ile Ala Leu Val Gln Gly Gly Lys Val Ile Phe Gly Ala
65 70 75 80

Glu Leu Thr His Arg Gly Gln Ser Ile Ala Ala Ser Leu Asp Ser Arg
85 90 95

Arg Ser Leu Arg Arg Ser Arg Arg Asn Arg His Thr Arg Tyr Arg Gln

100 105 110

Ala Arg Phe Leu Asn Arg Thr Arg Lys Glu Gly Trp Leu Ala Pro Ser
115 120 125

Leu Gln His Arg Val Glu Thr Thr Leu Thr Trp Val Ile Lys Phe Ile
130 135 140

Lys Leu Ala Pro Ile Asp Ser Ile Val Gln Glu Leu Val Arg Phe Asp
145 150 155 160

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

165 170 175

Gly Glu Leu Gln Gly Tyr Glu Val Arg Glu Tyr Leu Leu Asn Val Arg
180 185 190

Pro Val Ser Val Lys Thr Lys Ala
195 200

<210> 408

<211> 423

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-362 effector

<400> 408

Met Ser Asn Leu Ile Phe Val Leu Asp Ser Asn Gln Lys Pro Leu Thr

1 5 10 15

Pro Cys Lys Pro Ser Met Ala His Lys Leu Leu Thr Ala Asn Lys Ala

20 25 30

Ala Val Phe Arg Met Tyr Pro Phe Thr Ile Ile Leu Lys Lys Ile Val

35 40 45

Ser Ala Thr Pro Glu Pro Thr Thr Leu Lys Ile Asp Pro Gly Ser Lys

50 55 60

Thr Thr Gly Ile Ala Leu Leu Gln Gly Glu Lys Val Ile Trp Gly Ala

65 70 75 80

Glu Leu Thr His Arg Gly Gln Ala Ile Lys Ala Ser Leu Glu Ser Arg

85 90 95

Arg Ala Ile Arg Arg Gly Arg Arg Asn Arg His Thr Arg Tyr Arg Gln

100 105 110

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

115 120 125

Leu Gln His Arg Val Glu Thr Thr Leu Cys Trp Val Asn Arg Leu Ile

130 135 140

Lys Leu Val Pro Ile Ser Ser Ile Val Gln Glu Leu Val Arg Phe Asp

145 150 155 160

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

165 170 175

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

180 185 190

Asp Arg Lys Cys Ala Tyr Cys Gly Val Glu Asn Val Pro Leu Gln Val

195 200 205

Glu His Ile His Pro Lys Ala Lys Gly Gly Thr Asn Arg Ile Ser Asn
210 215 220
Leu Cys Leu Ala Cys Glu Lys Cys Asn Thr Lys Lys Gly Ser Gln Asp
225 230 235 240
Ile Glu Lys Phe Leu Ala Lys Lys Pro Asp Ile Leu Lys His Ile Leu
245 250 255
Ser Gln Ala Lys Arg Pro Leu Lys Asp Ala Ala Ala Val Asn Ser Thr

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

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

385 390 395 400
Leu Val Ser Gly Ile Ser Phe Lys Tyr Cys Lys Ile Val His His Lys
405 410 415
Asp Gly Tyr Ser Tyr Ala Phe
420

<210> 409
<211> 233
<212> PRT
<213> Unknown

<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-363 effector
<400> 409

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

1 5 10 15

Pro Val His Pro Gly Thr Ala Arg His Leu Leu Asn Thr Gly Lys Ala
20 25 30

Ala Val Phe Arg Arg Tyr Pro Phe Thr Ile Ile Leu Lys Gln Ala His
35 40 45

Pro Asp Ala Pro Val Gln Asp Leu Glu Leu Lys Leu Asp Pro Gly Ser
50 55 60

Lys Thr Thr Gly Ile Ala Ile Asn Gln Gly Asn Pro Ile Ile Cys Gly

65 70 75 80

Ala Glu Leu Pro His Arg Gly Gln Pro Ile Lys Glu Ser Leu Leu Ser
85 90 95

Arg Arg Gln Ser Arg Arg Ser Arg Arg Asn Gly Gln Thr Arg Asp Arg
100 105 110

Gln Ala Arg Phe Leu Asn Arg Thr Arg Pro Gln Ser Trp Leu Thr Pro
115 120 125

Ser Leu Gln His Arg Val Asp Thr Val Leu Thr Trp Val Asn Arg Leu

130 135 140

Gly Lys Leu Val Pro Ile Asn Ser Ile Ala Arg Glu Leu Val Arg Phe
145 150 155 160

Asp Leu Gln Arg Leu Gln Asn Pro Gln Ile Ser Ala Val Glu Ser Gln
165 170 175

Gln Gly Glu Leu His Gly Tyr Glu Val Arg Glu Tyr Ser Pro Tyr Leu
180 185 190

Gly Arg Val Leu Cys Arg Trp Ser Gly Ser Phe Asp Ile Val Thr Gln

195 200 205

Ser Gly Arg Val Ala Gly Ile Asn His Lys His Cys Gln Pro Ile His
210 215 220

Lys Lys Asp Gly Tyr Ala Tyr Gly Phe
225 230

<210> 410

<211> 443

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-364 effector

<400> 410

Met Ser Asn Val Phe Val Leu Asp Thr Met Glu Arg Ser Leu Asn Pro
1 5 10 15

Val His Pro Gly Arg Ala Arg Val Leu Leu Ser Ser Gly Gln Ala Ala
20 25 30

Val Phe Arg Tyr Tyr Pro Phe Thr Ile Ile Leu Lys Lys Glu Val Gly
35 40 45

Ser Pro Val Leu His Ser Leu Arg Leu Lys Ile Asp Pro Gly Ser Lys
50 55 60

Thr Thr Gly Leu Ala Met Val Asn Asp Ala Ser Gly Glu Val Val Phe
65 70 75 80

Ala Ala Glu Leu Ile His Arg Gly Gln Ala Ile Lys Lys Arg Leu Asp
85 90 95

Glu Arg Arg Ala Ala Arg Arg Asn Arg Arg Asn His Lys Thr Arg Tyr
100 105 110

Arg Lys Pro Arg Phe Leu Asn Arg Arg Lys Pro Lys Gly Trp Leu Ala
115 120 125

Pro Ser Leu Glu Ser Arg Val Ala Asn Ile Leu Thr Trp Thr His Arg
130 135 140

Leu Met Arg Tyr Cys Pro Leu Ala Ala Leu Ser Gln Glu Val Val Lys

145 150 155 160

Phe Asp Ile Gln Ala Met Glu Gln Pro Glu Ile Asp Gly Val Glu Tyr

165 170 175

Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu

180 185 190

Lys Trp Gln Arg Ala Cys Ala Tyr Cys Gly Lys Lys Asp Val Pro Leu

195 200 205

Gln Val Glu His Ile Gln Ala Arg Ala Lys Gly Gly Thr Asp Arg Val

210 215 220

Ser Asn Leu Cys Leu Ala Cys Glu Gln Cys Asn Ala Ala Lys Gly Ile

225 230 235 240

Gln Asp Ile Arg Asp Phe Leu Lys Arg Lys Pro Glu Val Leu Lys Arg

245 250 255

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

260 265 270

Ala Thr Arg Trp Ala Leu Tyr Glu Arg Leu Asn Thr Leu Gly Phe Pro

275 280 285

Val Glu Val Gly Thr Gly Gly Arg Thr Lys Trp Asn Arg Val Ser Arg

290 295 300

Gly Leu Glu Lys Ser His Trp Ile Asp Ala Ala Cys Val Gly Ala Ser

305 310 315 320

Thr Pro Glu Thr Leu Arg Ile Ala Gly Val Asn Pro Leu Leu Val Thr

325 330 335

Ala Thr Gly His Gly Ser Arg Gln Met Cys Leu Met Asp Lys Tyr Gly

340 345 350

Phe Pro Arg Thr Lys Ala Lys Gln Lys Gln Phe Thr His Ser Phe His

355 360 365

Thr Gly Asp Ile Val Gln Ala Ile Ile Pro Val Pro Leu Asn His Ala

370 375 380

Gly Val His Gly Gly Arg Met Ser Ala Lys Ala Lys Gly Gly Phe Thr

385 390 395 400

Leu Thr Thr Ala Lys Gly Lys Ile Thr Asp Val Gly Arg Lys Tyr Cys
405 410 415
Arg Val Leu Gln Arg Ser Asp Gly Tyr Gly Tyr His Ser Ala Pro Val
420 425 430
Gly Ala Phe Leu Ser Ser Leu Ser Leu Lys Ala
435 440

<210> 411
<211> 418
<212> PRT
<213> Unknown
<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors
<220><223> Description: MG35-365 effector
<400> 411
Met Ser Asn Tyr Val Leu Val Leu Asp Ala Asn Gln Gln Pro Leu Ser
1 5 10 15
Pro Cys Gln Pro Arg Val Ala Arg Lys Leu Leu Glu Ser Asn Lys Ala
20 25 30
Ala Val Phe Arg Arg Phe Pro Phe Thr Ile Leu Leu Lys Arg Thr Val
35 40 45

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

Gln Pro Arg Tyr Asp Asn Arg Arg Lys Pro Glu Gly Trp Leu Ala Pro
115 120 125
Ser Leu Leu His Arg Val Gln Thr Thr Val Thr Trp Val Lys Arg Leu

130 135 140

Cys Arg Trp Val Pro Ile Thr Gly Ile Ser Leu Glu Leu Val Lys Phe
145 150 155 160
Asp Leu Gln Gln Met Gln Asn Pro Glu Ile Arg Gly Ile Gln Tyr Gln
165 170 175

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

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

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

Met Val Lys Ala Val Val Thr Lys Gly Lys Lys Ile Gly Thr Tyr Val
370 375 380

Gly Lys Val Ala Cys Arg Ala Thr Gly Arg Phe Asn Ile Ser Thr Leu
385 390 395 400
Val Gly Leu Val Gln Gly Ile Gly His Lys Ser Cys Gln Val Leu His
405 410 415
Arg Lys

<210> 412
<211> 490
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors
<220><223> Description: MG35-366 effector
<400> 412
Met Ser Thr Thr Arg Arg Lys Ala Lys Ala Arg His Pro Gly Val Leu
1 5 10 15
His Gln Pro Gln Ala Leu Ser Pro Thr Thr Lys Lys Arg Ala Ala Thr
20 25 30
Arg Leu Pro Thr Ser Arg Leu Asn Asp Leu Arg Ala Pro Gly Glu Val
35 40 45
Thr Ile Thr Cys Ala Ser Arg Arg Gly Arg Leu Arg Ala His Leu Arg

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

115 120 125
Lys Val Thr Gly Leu Ala Leu Val Ala Glu Phe Glu Lys Arg Gly Arg

130 135 140

Thr Val Val Trp Ala Ala Asn Leu Ala His Arg Gly His Arg Val Lys

145 150 155 160

Ala Ser Met Thr Asp Arg Ala Met Phe Arg Arg Gly Arg Arg Gly Arg

165 170 175

Lys Thr Arg Tyr Arg Ala Ala Arg Phe Glu Asn Arg Thr Arg Pro Thr

180 185 190

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

195 200 205

Trp Tyr Ser Arg Leu Leu Ser Arg Ala Ser Ile Ser Val Ala Gln Val

210 215 220

Glu Thr Ser Ser Phe Asp Thr Gln Leu Met Glu Asn Ala Asp Ile Ser

225 230 235 240

Gly Val Glu Tyr Gln Gln Gly Glu Leu Gln Gly Tyr Glu Val Arg Gln

245 250 255

Tyr Val Leu Glu Arg Gly Gly His Thr Cys Ser Tyr Cys Asp Ala Lys

260 265 270

Asp Val Ala Leu His Leu Asp His Val Leu Pro Arg Ser Arg Gly Gly

275 280 285

Ser Asn Arg Val Ser Asn Leu Val Pro Ala Cys Lys Pro Cys Asn Asp

290 295 300

Ala Lys Ser Asn Arg Ala Val Glu Asp Tyr Leu Val Asp Arg Pro Glu

305 310 315 320

Val Leu Arg Gln Val Lys Ala Gln Leu Arg Ser Pro Leu Lys Asp Ala

325 330 335

Ala Val Met Asn Ala Thr Arg Phe Ala Ile Val Asp Ala Leu Arg Asp

340 345 350

Phe Gly Leu Glu Val Gln Met Trp Ser Gly Gly Arg Thr Lys Trp Asn

355 360 365

Arg Thr Asn Leu Gly Leu Pro Lys Asp His Trp Ile Asp Ala Ala Cys

370 375 380

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

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

<210> 413
<211> 38
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors
<220><223> Description: MG35-367 effector
<400> 413
Met Ser Val Phe Leu Val Asp Arg Arg Lys Lys Pro Leu Met Pro Cys
1 5 10 15
Ser Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Lys Ala Val Val
20 25 30
His Arg Arg Tyr Pro Phe
35

<210> 414
<211> 454
<212> PRT
<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors
<220><223> Description: MG35-368 effector
<400> 414

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

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

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

180 185 190
Leu Leu Glu Lys Gly Gly Arg Cys Cys Ala Tyr Cys Asp Val Gln Asn
195 200 205

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

245 250 255
Leu Ala Lys Ile Lys Ala Ser Leu Lys Arg Pro Leu Lys Asp Ala Ala
260 265 270
Ala Val Asn Ala Thr Arg Trp Ala Leu Phe Asn Arg Leu Lys Ala Thr
275 280 285
Asp Leu Pro Val Thr Thr Gly Ser Gly Gly Arg Thr Lys Trp Asn Arg
290 295 300
Ser Arg Leu Gly Val Pro Lys Thr His Ala Leu Asp Ala Ala Cys Val

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

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

435 440 445
Pro Pro Ala Lys Ser Arg

450

<210> 415

<211> 333

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-369 effector

<400> 415

Met Ser Val Phe Val Leu Asp Lys His Lys Lys Pro Leu Met Pro Cys
1 5 10 15
Ser Glu Lys Arg Ala Arg Leu Met Leu Glu Arg Gly Arg Ala Arg Val

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

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

145 150 155 160
Leu Val Arg Phe Asp Met Gln Val Ile Glu Asn Pro Asp Ile Ala Gly
165 170 175

Thr Gly Tyr Gln His Gly Thr Leu Phe Gly Thr Glu Leu Arg Glu Tyr
180 185 190
Leu Leu Glu Lys Gly Gly Arg Cys Cys Ala Tyr Cys Asp Val Gln Asn
195 200 205
Val Pro Leu Asn Ile Asp His Val Val Pro Arg Ala Ser Gly Gly Ser

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

275 280 285
Asp Leu Pro Val Thr Thr Gly Ser Gly Gly Arg Thr Lys Trp Asn Arg
290 295 300
Ser Arg Leu Gly Val Pro Lys Thr His Ala Leu Asp Ala Ala Cys Val
305 310 315 320
Gly Glu Val Glu Ala Leu Ser Gly Trp Asp Val Pro Gly
325 330

<210> 416
<211> 448
<212> PRT
<213> Unknown
<220><223> Description of Unknown:

uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-370 effector
<400> 416
Met Ser Val Phe Val Leu Asp Lys His Lys Lys Pro Leu Met Pro Cys
1 5 10 15
Ser Glu Lys Arg Ala Arg Leu Met Leu Glu Arg Gly Arg Ala Arg Val

20 25 30

His Arg Leu His Pro Phe Thr Val Arg Leu Val Asp Arg Val Ala Ala

35 40 45

Asp Ser Val Leu Gln Pro Ile Ala Val Lys Leu Asp Pro Gly Ser Lys

50 55 60

Thr Thr Gly Ile Ala Ala Val Arg Glu Gly Gly Ala Val Leu Phe Leu

65 70 75 80

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

85 90 95

Arg Gly Ala Met Arg Arg Arg Arg Arg Gly Asn Leu Arg Tyr Arg Pro

100 105 110

Ala Arg Phe Asp Asn Arg Thr Lys Pro Lys Gly Trp Leu Pro Pro Ser

115 120 125

Leu Gln His Arg Val Asp Thr Val Ser Ser Trp Val Ala Arg Leu Arg

130 135 140

Arg Ala Leu Pro Val Thr Ser Ile Ala Thr Glu Leu Val Arg Phe Asp

145 150 155 160

Met Gln Leu Leu Glu Asn Pro Asp Ile Ser Gly Val Gly Tyr Gln Gln

165 170 175

Gly Thr Leu Ala Gly Tyr Glu Leu Arg Glu Phe Leu Leu Asn Lys Trp

180 185 190

Asn Arg Ala Cys Ala Tyr Cys Gly Val Val Asn Val Pro Leu Gln Ile

195 200 205

Glu His Ile His Ser Lys Ala Arg Gly Gly Ser Asn Arg Glu Ser Asn

210 215 220

Leu Thr Leu Ala Cys Gln Pro Cys Asn Gln Glu Lys Gly Ala Gln Pro

225 230 235 240

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

245 250 255

Ala Thr Ala Lys Arg Pro Leu Lys Asp Ala Ala Ala Val Asn Ala Thr

260 265 270

Arg Trp Ala Leu Phe Asn Arg Leu Lys Gln Ala Gly Leu Pro Val Ser
275 280 285
Thr Gly Ser Gly Gly Arg Thr Lys Trp Asn Arg Ser Arg Leu Gly Ile
290 295 300

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

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

Ala Ser Ser Pro Cys Leu Lys Ala Gly Val Ser Ala Ala Lys Phe Pro
435 440 445

<210> 417
<211> 114
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-371 effector
<400> 417
Met Ser Val Phe Val Leu Asp Lys Arg Lys Lys Pro Leu Met Pro Cys

1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Arg Ile

20 25 30

Ala Arg Arg Phe Pro Phe Thr Ile Arg Pro Val Asp Arg Arg Leu Thr

35 40 45

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

50 55 60

Thr Thr Arg Phe Ser Val Val Arg Asp Glu Asp Gly Asn Lys Ala Ser

65 70 75 80

Ser Ala Leu Phe Leu Ala Glu Leu Gln His Arg Gly Ala Gln Ile Ser

85 90 95

Glu Ala Leu Thr Ala Arg Arg Ala Met Arg Arg Arg Arg Arg Gly Asn

100 105 110

Leu Arg

<210> 418

<211> 419

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-372 effector

<400> 418

Met Ser Val Phe Val Leu Asp Lys Arg Lys Met Pro Leu Met Pro Cys

1 5 10 15

Ser Glu Lys Arg Gly Arg Lys Leu Leu Glu Ser Gly Arg Ala Arg Val

20 25 30

His Arg Leu Met Pro Phe Thr Ile Arg Leu Val Asp Arg Thr Val Lys

35 40 45

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

50 55 60

Thr Thr Gly Ile Ala Leu Val Arg Asp Ser Glu Thr Ile Asn Leu Glu
65 70 75 80

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

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

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

Thr Lys Arg Ser Leu Arg Asp Ala Ala Ala Val Asn Thr Thr Arg Trp
275 280 285
Ala Leu Phe Asn Ala Leu Lys Ala Thr Gly Leu Pro Ile Ala Thr Gly
290 295 300
Ser Gly Gly Gln Thr Lys Tyr Asn Arg Ser Arg Leu Lys Ile Pro Lys

305 310 315 320

Thr His Ala Leu Asp Ala Val Cys Val Gly Thr Thr Asp Asp Val Ala

325 330 335

Gly Trp Gln Lys Pro Thr Met Val Ile Lys Ala Thr Gly Arg Gly Ser

340 345 350

Tyr Gln Arg Thr Arg Leu Asp Lys Tyr Gly Phe Pro Arg Gly His Leu

355 360 365

Thr Arg Gln Lys Arg Ile Lys Gly Phe Gln Thr Gly Asp Met Val Glu

370 375 380

Ala His Val Thr Lys Gly Lys Lys Ile Gly Arg Tyr Thr Gly Arg Val

385 390 395 400

Ala Val Arg Thr Ser Gly Ser Phe Asn Ile Gln Thr Ala Asp Ser Val

405 410 415

Val Gln Gly

<210> 419

<211> 463

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-373 effector

<400> 419

Met Ser Val Phe Val Leu Asp Lys Arg Lys Met Pro Leu Met Pro Cys

1 5 10 15

Ser Glu Lys Arg Gly Arg Lys Leu Leu Glu Ser Gly Arg Ala Arg Val

20 25 30

His Arg Leu Met Pro Phe Thr Ile Arg Leu Val Asp Arg Thr Val Lys

35 40 45

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

50 55 60

Thr Thr Gly Ile Ala Leu Val Arg Asp Ser Glu Thr Ile Asn Leu Glu
65 70 75 80
Thr Gly Glu Ile Ala Thr Thr Ala His Val Leu Asn Leu Phe Glu Leu

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

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

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

275 280 285
Ala Leu Phe Asn Ala Leu Lys Ala Thr Gly Leu Pro Ile Thr Thr Gly
290 295 300
Ser Gly Gly Gln Thr Lys Tyr Asn Arg Ser Arg Leu Lys Ile Pro Lys

305 310 315 320

Thr His Ala Leu Asp Ala Val Cys Val Gly Thr Thr Asp Asp Val Ala

325 330 335

Gly Trp Gln Lys Pro Thr Met Ala Ile Lys Ala Thr Gly Arg Gly Arg

340 345 350

Phe Lys Arg Thr Gln Arg Asp Lys Tyr Gly Phe Pro Arg Gly His Leu

355 360 365

Thr Arg Gln Lys Arg Ile Lys Gly Phe Gln Thr Gly Asp Met Val Glu

370 375 380

Ala His Val Thr Lys Gly Lys Lys Ile Gly Arg Tyr Thr Gly Arg Val

385 390 395 400

Ala Val Arg Thr Ser Gly Ser Phe Asn Ile Gln Thr Ala Asp Ser Val

405 410 415

Val Gln Gly Ile Gly Tyr Arg Tyr Cys Thr Val Ile Gln Arg Ala Asp

420 425 430

Gly Tyr Gly Tyr Ser Trp Gln Ala Arg Ala Ala Thr Thr Arg Trp Ser

435 440 445

Pro Leu Tyr Leu Pro Thr Leu Asn Asn Gly Val Ser Arg Arg Ile

450 455 460

<210> 420

<211> 214

<212> PRT

<213> Unknown

<220

><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-374 effector

<400> 420

Met Ser Val Phe Val Leu Asp Lys Arg Lys Arg Pro Leu Met Pro Cys

1 5 10 15

Ser Glu Lys Arg Ala Arg Leu Leu Leu Ala Lys Gly Arg Ala Arg Val

20 25 30

Ala Arg Arg Tyr Pro Phe Thr Ile Arg Leu Ile Asp Arg Thr Val Ala
35 40 45

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

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

Val Glu Tyr Gln Arg Gly Thr Leu Ala Gly Ala Glu Ala Arg Glu Tyr
180 185 190
Leu Leu Ala Lys Trp Asp Arg Ala Cys Ala Tyr Cys Gly Ile Ala Gly
195 200 205
Val Pro Leu Asn Ile Asp
210
<210> 421
<211> 436
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors

<220><223> Description: MG35-375 effector

<400> 421

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

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

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

Val Arg Glu Tyr Leu Leu Glu Lys Trp Gly Arg Lys Cys Val Tyr Cys
195 200 205
Asp Ala Glu Asn Val Pro Leu Glu Ile Glu His Ile Val Pro Arg Ser
210 215 220
Arg Gly Gly Gly Asn Arg Val Ser Asn Leu Thr Leu Ala Cys Arg Gly

225 230 235 240

Cys Asn Gln Ser Lys Gly Asn Met Asp Val Arg Glu Phe Leu Ser Gly

245 250 255

Asp Thr Gly Arg Leu Ala Arg Val Leu Ala Phe Ala Lys Arg Thr Leu

260 265 270

Arg Asp Ala Ala Ala Val Asn Ser Thr Arg Trp Ser Leu Phe Asn Ala

275 280 285

Leu Lys Asn Thr Gly Met Pro Val Glu Thr Gly Ser Gly Gly Arg Thr

290 295 300

Lys Trp Asn Arg Arg Arg Leu Gly Ile Pro Lys Thr His Ala Leu Asp

305 310 315 320

Ala Val Cys Val Gly Asp Val Asp Ala Val Ile Asp Trp Gln Gln Pro

325 330 335

Thr Leu Ser Ala Gln Cys Thr Gly Arg Gly Ala Tyr Lys Arg Thr Arg

340 345 350

Leu Thr Lys Tyr Gly Phe Pro Arg Gly Phe Leu Met Arg Ser Lys Ser

355 360 365

Val Arg Gly Phe Gln Thr Gly Asp Met Val Arg Ala His Val Glu Ser

370 375 380

Gly Lys Asn Ala Gly Val His Val Gly Arg Val Ala Val Arg Ala Ser

385 390 395 400

Gly Ser Phe Asn Ile Arg Thr Gln Asp Gly Leu Ile Gln Gly Val His

405 410 415

Ala Arg Phe Cys Ser Leu Leu Gln Arg Ser Asp Gly Tyr Ser Tyr Ala

420 425 430

Phe Arg Ser Ala

435

<210> 422

<211> 506

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-376 effector

<400> 422

Met Thr Met Val Tyr Val Gln Asn Lys Asp Gly Lys Pro Leu Met Pro
1 5 10 15

Thr Thr Arg Tyr Cys Tyr Val Arg Leu Leu Leu Lys Glu Lys Lys Ala
20 25 30

Arg Val Val Cys Asn Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr
35 40 45

Pro Asp Ile Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr
50 55 60

Asn Ile Gly Val Ala Val Val Lys Glu Asp Gly Gln Cys Val Phe Ser
65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Asp Ile Pro Leu Leu Met Lys Lys
85 90 95

Arg Ala Gly Phe Arg Arg Gln His Arg Thr Leu Asp Arg Arg Arg Asn
100 105 110

Arg Gln Arg Arg Ala Lys Ala Ala Gly Thr Ala Val Glu Asn Glu Thr
115 120 125

Ile Glu Arg Leu Leu Pro Gly Tyr Glu Lys Pro Val Val Cys His Tyr
130 135 140

Ile Arg Asn Lys Glu Ala Arg Phe Asn Asn Arg Ser Arg Thr Ala Gly
145 150 155 160

Trp Leu Thr Pro Thr Ala Asn His Leu Leu Gln Thr His Ile Asn Leu
165 170 175

Ile Ala Lys Ile Ala Lys Phe Leu Pro Ile Thr Lys Val Val Val Glu
180 185 190

Leu Asn Arg Phe Ala Phe Met Ala Met Asp Asn Pro Asn Ile Arg Arg
195 200 205

Trp Glu Tyr Gln Gln Gly Pro Leu Tyr Gly Leu Gly Ser Val Glu Asp
210 215 220
Ala Val Tyr Ala Gln Gln Asp Gly His Cys Leu Phe Cys Lys Lys Pro
225 230 235 240

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

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

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

Lys Asp Met Ala Arg Ile Met Pro Gly Ala Val Met Asp Phe Cys Gly
435 440 445
Thr Val Gly Ile Phe Gln Gly Ser Asp Gly Phe His Asn Gly Lys Pro

450 455 460

Asp Tyr Tyr Lys Ser Thr Lys Gly Glu Lys Val Arg Met Gly Arg Cys
465 470 475 480

Ala Leu Leu Ala Gln Asn Ala Gly Met Val Phe Ile Pro Ala Arg Lys
485 490 495

Lys Ser Tyr Val Gly Lys His Ile Lys Ser
500 505

<210> 423

<211> 494

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-377 effector

<400> 423

Met Thr Met Val Tyr Val Gln Asn Lys Asp Gly Lys Pro Leu Met Pro
1 5 10 15

Thr Thr Arg Tyr Cys Tyr Val Arg Leu Leu Leu Lys Glu Lys Lys Ala
20 25 30

Arg Val Val Cys Thr Thr Pro Phe Thr Ile Gln Leu Asn Tyr Asp Thr
35 40 45

Ser Asp Ile Thr Gln Asp Leu Ile Leu Gly Ile Asp Pro Gly Arg Thr
50 55 60

Asn Ile Gly Val Ala Val Val Lys Glu Asn Gly Gln Cys Val Phe Ser
65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Glu Val Pro Leu Leu Met Lys Lys
85 90 95

Arg Ala Ala Phe Arg Arg Asn His Arg Thr Leu Asp Arg Arg Arg Lys
100 105 110

Arg Gln Arg Arg Ala Ile Ala Ala Gly Thr Thr Val Glu Ser Asn Thr
115 120 125

Ile Glu Arg Leu Leu Pro Gly Tyr Glu Lys Pro Val Val Cys His Tyr
130 135 140
Ile Arg Asn Lys Glu Ala Arg Phe Asn Asn Arg Ser Arg Pro Val Gly
145 150 155 160

Trp Leu Thr Pro Thr Ala Asn His Leu Leu Gln Thr His Ile Asn Leu
165 170 175
Ile Ala Lys Val Ala Lys Phe Leu Pro Ile Thr Lys Val Val Val Glu
180 185 190
Leu Asn Arg Phe Ala Phe Met Ala Met Asp Asn Pro Asn Ile Arg Arg
195 200 205
Trp Glu Tyr Gln Gln Gly Pro Leu Tyr Gly Leu Gly Ser Val Asp Asp
210 215 220

Ala Val Tyr Ala Gln Gln Ala Gly His Cys Leu Phe Cys Lys Lys Ser
225 230 235 240
Ile Asp His Tyr His His Val Val Pro Arg His Lys Gly Gly Ser Glu
245 250 255
Thr Leu Ala Asn Arg Cys Gly Leu Cys Glu Lys His His Asp Leu Val
260 265 270
His Lys Asp Lys Ala Trp Ala Glu Lys Leu Val Thr Arg Lys Gly Gly
275 280 285

Met Asn Lys Lys Tyr His Ala Leu Ser Val Leu Asn Gln Ile Ile Pro
290 295 300
His Leu Met Glu Tyr Leu Gly Glu Glu Thr Ser Tyr Asp Val Tyr Ala
305 310 315 320
Thr Asp Gly Arg Ser Thr Lys Gly Phe Arg Ile Ala Lys Asn Val Pro
325 330 335
Lys Glu His Tyr Thr Asp Ala Tyr Cys Ile Ala Cys Ser Ile Leu Asp
340 345 350

Ala Asn Thr Lys Val Ser Thr Pro Ala Glu Pro Phe Lys Leu Lys Gln
355 360 365
Phe Arg Arg His Asp Arg Gln Ser Cys Ile Arg Gln Met Val Asp Arg

370 375 380

Lys Tyr Ile Leu Asp Gly Lys Val Val Ala Thr Asn Arg His Lys Ala
385 390 395 400

Ile Glu Gln Lys Ser Asp Ser Leu Gln Glu Phe Arg Glu Val Tyr Gly
405 410 415

Asp Ala Ala Val Ser Gln Leu Thr Val Arg Pro His Ser Pro Gln Tyr
420 425 430

Lys Asp Met Ala Arg Ile Met Pro Gly Ala Val Met Asp Phe Asp Gly
435 440 445

Ala Val Gly Val Phe Gln Gly Ser Ser Gly Arg Asn Asn Gly Thr Pro
450 455 460

Asn Tyr Tyr Asn Ser Thr Lys Gly Ala Arg Val Leu Thr Asn Arg Cys
465 470 475 480

Ala Leu Leu Ala Lys Asn Val Gly Met Val Phe Ile Pro Ala
485 490

<210> 424

<211> 58

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-378 effector

<400> 424

Met Val Phe Val Leu Asp Lys Arg Lys Lys Pro Leu Met Pro Cys Ser
1 5 10 15

Glu Lys Arg Ala Arg Leu Phe Asn Pro Phe Thr Gly Thr Asp Phe Ala

20 25 30

Ser Thr Asp Glu Cys Ile Glu Phe Leu Lys Leu Val Met Gly Ala Asp
35 40 45

Asp Ser Gln Ile Glu Ile Ile Pro Gln Ser
50 55

<210> 425

<211> 438

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-379 effector

<400> 425

Met Val Phe Val Leu Asp Gln Asn Gly Asn Arg Leu Met Pro Cys Thr

1 5 10 15

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

20 25 30

Arg Ile Leu Pro Phe Val Ile Arg Ile Thr Asp Ile Lys Ala Asp Asp

35 40 45

Cys Glu Phe Gln Glu Leu Arg Ile Lys Leu Asp Pro Gly Ser Lys Thr

50 55 60

Thr Gly Val Ala Leu Ile Arg Glu Thr Val Asp Lys Thr Val Val Ile

65 70 75 80

Asn Leu Phe Glu Leu Val His Arg Gly Lys Gln Ile Ser Glu Ala Leu

85 90 95

Thr Ala Arg Arg Ser Met Arg Arg Gly Arg Arg Gly Arg Asn Thr Arg

100 105 110

Tyr Arg Gln Thr Arg Phe Asp Asn Arg Thr Arg Pro Gln Gly Trp Leu

115 120 125

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

130 135 140

Arg Ile Ser Arg Trp Ala Pro Val Thr Gly Leu Ala Gln Glu Leu Val

145 150 155 160

Arg Phe Asp Met Ala Leu Ile Gln Asn Pro Glu Ile Ser Gly Val Glu

165 170 175

Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Leu Arg Ser Tyr Leu Leu

180 185 190

Glu Lys Trp Lys Arg Thr Cys Ala Tyr Cys Asp Gln Glu Asn Val Pro

195 200 205

Leu Gln Ile Glu His Ile His Pro Lys Ser Arg Gly Gly Ser Asn Arg

210 215 220

Ala Ser Asn Leu Thr Leu Ala Cys Glu Tyr Cys Asn Gln Lys Lys Asn

225 230 235 240

Ser Leu Pro Ile Glu Val Phe Leu Ala Lys Gln Pro Glu Arg Leu Lys

245 250 255

Arg Ile Leu Thr Gln Ala Lys Lys Pro Leu Lys Asp Ala Ala Ala Val

260 265 270

Asn Ser Thr Arg Trp Ala Leu Phe Asn Ala Leu Lys Ala Thr Gly Leu

275 280 285

Pro Val Glu Val Gly Ser Gly Gly Lys Thr Lys Phe Asn Arg Ser Arg

290 295 300

Leu Asp Val Pro Lys Ala His Ala Leu Asp Ala Leu Cys Val Gly Asn

305 310 315 320

Val Val Gly Val Ala Gly Trp Lys Val Pro Thr Met Gln Ile Lys Cys

325 330 335

Met Gly Arg Gly Ser Tyr Gln Arg Thr Arg Leu Asn Ala Gln Gly Gly

340 345 350

Val Arg Gly Tyr Leu Thr Arg Gln Lys Thr His Phe Gly Phe Gln Thr

355 360 365

Gly Asp Met Val Lys Ala Asp Val Pro Thr Gly Lys Lys Ala Gly Lys

370 375 380

His Ser Gly Arg Val Ala Val Arg Thr Arg Gly Ser Phe Asn Ile Gln

385 390 395 400

Thr Leu Gln Gly Val Ile Gln Gly Ile Ser His Lys His Cys Thr Cys

405 410 415

Val Gln Arg Ala Asp Gly Tyr Gly Tyr Asn Gln Val Gln Phe Lys Glu

420 425 430

Met Glu Ser Val Ser Arg

435

<210> 426

<211> 166

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223

> Category: MG35 effectors

<220><223> Description: MG35-384 effector

<400> 426

Met Val Leu Val Leu Asp Lys Arg Lys Arg Pro Leu Met Pro Cys Thr

1 5 10 15

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

20 25 30

Lys Arg Val Pro Phe Thr Ile Arg Leu Val Asp Arg Leu Ser Glu Asp

35 40 45

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

50 55 60

Thr Gly Met Ala Met Val Arg Glu Thr Pro Asp Asn Gly Val Ala Val

65 70 75 80

Leu Asn Leu Phe Glu Leu Val His Arg Gly Lys Gln Ile Ser Glu Ala

85 90 95

Leu Thr Ala Arg Arg Ala Leu Arg Arg Arg Arg Arg Gly Thr Leu Arg

100 105 110

Tyr Arg Ala Pro Arg Phe Leu Asn Arg Val Lys Pro Glu Gly Trp Leu

115 120 125

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

130 135 140

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

145 150 155 160

Lys Phe Asp Met His Leu

165

<210> 427

<211> 306

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223

> Category: MG35 effectors

<220><223> Description: MG35-385 effector

<400> 427

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

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

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

Glu Leu Lys Gln Phe Arg Arg His Asp Arg Gln Ala Cys Ile Arg Gln

180 185 190

Met Val Asp Arg Lys Tyr Leu Leu Asp Gly Lys Val Val Ala Ala Asn

195 200 205

Arg His Lys Ala Ile Glu Gln Lys Ser Asp Ser Leu Glu Glu Phe Arg

210 215 220

Glu Ala Tyr Gly Glu Ala Ala Val Ser Gln Leu Thr Val Arg Pro His

225 230 235 240

Leu Pro Gln Tyr Lys Asp Met Thr Arg Ile Met Pro Gly Ala Val Met

245 250 255

Asp Phe Asp Gly Thr Ile Gly Val Phe Gln Gly Ser Glu Gly Phe His

260 265 270

Asn Gly Lys Ser Asn Tyr Tyr Lys Ser Thr Lys Gly Thr Lys Val Leu

275 280 285

Thr Arg Arg Cys Ala Leu Leu Ala Lys Asn Val Gly Met Val Phe Ile

290 295 300

Pro Ala

305

<210> 428

<211> 43

<212

> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-386 effector

<400> 428

Met Val Tyr Val Leu Ser Arg Asn Lys Lys Pro Leu Met Pro Cys Thr

1 5 10 15

Glu Lys Arg Ala Arg Leu Leu Leu Val Arg Gly Arg Ala Arg Ile His

20 25 30

Arg Met Val Pro Phe Ala Ile Arg Leu Thr Asp

35 40

<210> 429

<211> 269

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-387 effector

<400> 429

Met Tyr Ala Gln Gln Asp Gly His Cys Leu Phe Cys Lys Lys Pro Ile
1 5 10 15

Asp His Tyr His His Val Ile Pro Arg His Lys Arg Gly Ser Glu Thr
20 25 30

Leu Ala Asn Arg Cys Gly Leu Cys Ala Lys His His Ala Leu Val His

35 40 45

Lys Asp Lys Ala Trp Glu Glu Lys Met Val Thr Arg Lys Gly Gly Met
50 55 60

Asn Lys Lys Tyr His Ala Leu Ser Val Leu Asn Gln Ile Ile Pro His
65 70 75 80

Leu Met Glu His Leu Gly Ser Glu Thr Pro Tyr Asp Val Tyr Ala Thr
85 90 95

Asp Gly Lys Ser Thr Lys Gly Phe Arg Ile Ala Lys Asn Val Pro Lys

100 105 110

Glu His Tyr Thr Asp Ala Tyr Cys Ile Ala Cys Ser Ile Leu Asp Thr
115 120 125

Asp Ile Glu Val Ser Ala Pro Val Glu Pro Phe Glu Leu Lys Gln Phe
130 135 140

Arg Arg His Asp Arg Gln Ser Cys Ile Arg Gln Met Val Asp Arg Lys
145 150 155 160

Tyr Leu Leu Asp Gly Lys Val Val Ala Thr Asn Arg His Lys Ala Ile

165 170 175

Glu Gln Lys Ser Asp Ser Leu Gln Glu Phe Arg Glu Ala His Gly Asn

180 185 190

Ala Ala Val Ser Gln Leu Thr Val Lys Pro His His Pro Gln Cys Lys

195 200 205

Asp Met Ala Arg Ile Met Pro Gly Ala Val Met Val Phe Asp Gly Ala

210 215 220

Val Gly Val Phe Gln Gly Ser Ser Gly Arg Asn Asn Gly Thr Pro Asn

225 230 235 240

Tyr Tyr Asn Ser Thr Lys Gly Glu Arg Phe Leu Met Arg Ser Cys Val

245 250 255

Leu Leu Ala Gln Asn Ala Gly Met Val Phe Ile Pro Ala

260 265

<210> 430

<211> 278

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-388 effector

<400

> 430

Met Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys Trp Asp Arg Thr Cys

1 5 10 15

Ala Tyr Cys Gly Ala Lys Asp Val Pro Met Gln Ile Glu His Ile His

20 25 30

Pro Lys Ser Lys Asn Gly Ser Asn Arg Ile Ser Asn Leu Ala Leu Ala

35 40 45

Cys Gln Cys Cys Asn Gln Lys Lys Ala Ala Leu Pro Val Glu Met Phe

50 55 60

Leu Ala Lys Lys Pro Lys Leu Leu Lys Arg Ile Leu Ala Gln Ala Lys

65 70 75 80

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

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

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

His Arg Asp Ala Ser His Pro Ala Leu Tyr Leu Pro Gly Leu Lys Ala
260 265 270
Glu Val Ser Arg Ala Asn
275

<210> 431
<211> 339
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-389 effector

<400> 431

```
Asn Leu Phe Glu Leu Val His Arg Gly Arg Gln Ile Ser Glu Ala Leu
1               5                  10                  15

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

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

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

Val Val Glu Thr Gly Thr Gly Gly Gln Thr Lys Phe Asn Arg Ser Gln
    210                 215                 220
```

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

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

Val Gln Arg

<210> 432
<211> 331
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-390 effector
<400> 432
Pro Ala Arg Phe Asp Asn Arg Thr Arg Lys Ala Gly Trp Leu Pro Pro
1 5 10 15
Ser Val Gln His Arg Leu Asp Thr Thr Phe Ala Leu Val Gln Lys Leu
20 25 30
Lys Arg Arg Cys Pro Ile Ser Ala Ile Val Phe Glu Gln Val Lys Phe

35 40 45
Asp Met Gln Lys Met Gln Asn Pro Asn Ile Gln Gly Val Glu Tyr Gln

50 55 60

His Gly Thr Leu Phe Gln Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys

65 70 75 80

His Arg His Thr Cys Ala Tyr Cys Gly Gly Glu Ser Gln Asp Ala Ile

85 90 95

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

100 105 110

Ile Arg Asn Leu Val Met Ala Cys His Thr Cys Asn Gln Thr Lys Gly

115 120 125

Asn Arg Thr Leu Ser Glu Phe Leu Thr Val Leu Lys Asn Thr Lys Leu

130 135 140

Asp Lys Val Arg Lys Val Asn Ile Thr Gln Ile Leu Ala Gly Lys Val

145 150 155 160

Phe Arg Leu Lys Asp Ala Thr Ala Val Asn Ala Cys Arg His Gln Leu

165 170 175

Gly Lys Thr Leu Leu Thr Leu Ser Leu Pro Val Ser Thr Gly Thr Gly

180 185 190

Ala Gln Thr Lys Tyr Asn Arg Met His Tyr Gln Leu Pro Lys Ser His

195 200 205

Ala Leu Asp Ala Leu Met Thr Gly Asn Met Glu Lys Pro Ile Glu Ala

210 215 220

Trp Asn Lys Pro Thr Leu Ile Val Lys Ala Met Gly Arg Gly Cys Tyr

225 230 235 240

Gln Arg Thr Arg Leu Asn Gln Tyr Gly Phe Pro Arg Gly Tyr Leu Gln

245 250 255

Arg Lys Lys Thr Tyr Phe Gly Phe Gln Thr Gly Asp Leu Val Val Ser

260 265 270

Thr Val Leu Lys Gly Lys Lys Ile Gly Thr Tyr Ile Gly Arg Leu Ala

275 280 285

Val Arg Glu Ser Gly Tyr Phe Asn Ile Gln Thr Pro Ala Gly Val Ile

290 295 300

Gln Gly Ile Ser His Lys Thr Cys Arg Leu Ile Gln Arg Asn Thr Gly

305 310 315 320

Tyr His Tyr Tyr Phe Asn Gln Lys Ile Ala Asn

325 330

<210> 433

<211> 127

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-391 effector

<400> 433

Pro Phe Glu Leu Lys Gln Phe Arg Arg His Asp Arg Gln Ala Cys Ile

1 5 10 15

Arg Gln Met Val Asp Arg Lys Tyr Leu Leu Asp Gly Lys Val Val Ala

20 25 30

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

35 40 45

Phe Arg Glu Ala Tyr Gly Ser Ala Ala Val Ser Gln Leu Thr Val Lys

50 55 60

Pro His Pro Pro Gln Tyr Lys Asp Met Thr Arg Ile Met Pro Gly Ala

65 70 75 80

Val Met Asp Phe Asn Gly Thr Ile Gly Val Met Gln Ser Ser Ile Val

85 90 95

Gly Ser Phe Tyr Lys Ser Thr Lys Gly His Lys Ser Thr Pro Arg Arg

100 105 110

Cys Val Leu Leu Ala Gln Asn Thr Gly Met Val Phe Thr Pro Ala

115 120 125

<210> 434

<211> 191

<212> PRT

<213> Unknown

<220

><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-392 effector

<400> 434

Pro Ile Arg Arg Asp Arg Ile Leu Arg Gln Ala Gln Gln Pro Leu Arg
1 5 10 15

Asp Ala Ala Ala Val Asn Gly Thr Arg Trp Ala Ile Trp Glu Ile Leu
20 25 30

Thr Lys Thr Gly Leu Pro Val Glu Ser Thr Thr Gly Gly Arg Thr Lys
35 40 45

Trp Asn Arg Ser Arg Leu Gly Ile Pro Lys Arg Asp Ala Phe Asp Ala
50 55 60

Ala Cys Ala Gly Thr Val Asp Gln Val Leu Gly Trp Asp Arg Pro Ile
65 70 75 80

Gln Arg Ile Asp Cys Leu Gly Arg Gly Ser His Gln Arg Thr Leu Val
85 90 95

Thr Lys Asp Gly Phe Pro Arg Gly Tyr Leu Pro Arg Thr Lys Ile Val
100 105 110

Gln Gly Phe Arg Thr Gly Asp His Val Arg Ala Met Val Pro Thr Gly
115 120 125

Lys Lys Ala Gly Thr Trp Ile Gly Arg Val Ala Val Arg Ser Thr Gly
130 135 140

Ser Phe Asn Ile Gln Thr Gly Thr Asp Thr Val Gln Gly Ile Ala Ala
145 150 155 160

Arg Cys Cys Thr Leu Leu Gln Arg Gly Asn Gly Tyr Arg Tyr Ser Leu
165 170 175

Ala Leu Pro Arg Thr Glu His Ala Val Arg Pro Ser Ser Val Ala
180 185 190

<210> 435

<211> 372

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-393 effector

<400> 435

Pro Lys Leu Ile Thr Leu Lys Leu Asp Pro Gly Ser Gln Thr Thr Gly
1 5 10 15
Ile Ala Leu Val Gln Asp Asp Arg Val Ile Cys Gly Ala Glu Leu Ser

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

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

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

195 200 205

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

210 215 220

Leu Phe Asn Arg Leu Lys Glu Thr Gly Leu Ser Val Ser Ser Gly Ser

225 230 235 240

Gly Gly Leu Thr Lys Phe Asn Arg Thr Arg Leu Lys Leu Pro Lys Thr

245 250 255

His Trp Leu Asp Ala Ala Cys Val Gly Gln Ile Glu Glu Leu Ser Val

260 265 270

Leu Thr Asn Lys Pro Leu Leu Ile Lys Ala Thr Gly His Gly Thr Arg

275 280 285

Gln Met Cys Arg Thr Asp Lys Phe Gly Phe Pro Ser Arg Tyr Val Pro

290 295 300

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

305 310 315 320

Ile Val Thr Ala Gly Lys Lys Ile Gly Thr Tyr Val Gly Arg Val Thr

325 330 335

Val Arg Ser Ser Gly Ser Phe Asn Ile Ser Ala Asp Thr Leu Val Gln

340 345 350

Gly Ile Ser Ser Lys Tyr Cys Lys Thr Ile His Lys Lys Asp Gly Ser

355 360 365

Asn Tyr Ala Phe

370

<210> 436

<211> 432

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-394 effector

<400> 436

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

1 5 10 15

Gly Arg Ala Cys Val His Leu Val Met Pro Phe Thr Ile Arg Ile Val

20 25 30

Asp Leu Lys Ala Glu Asn Cys Ala Phe Gln Ala Leu Arg Val Lys Leu

35 40 45

Asp Pro Gly Ser Lys Ala Thr Gly Ile Ala Leu Val Arg Glu Thr Glu

50 55 60

Gly Lys Gly Val Ala Val Val Asn Leu Phe Glu Leu Val His Arg Gly

65 70 75 80

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

85 90 95

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

100 105 110

Asn Lys Gln Arg Gly Trp Leu Ala Pro Ser Leu Gln His Arg Val Asp

115 120 125

Thr Ser Met Ala Trp Val Ser Arg Ile Gln Arg Leu Ala Pro Val Ser

130 135 140

Ala Ile Ser Thr Glu Leu Val Arg Phe Asp Met Gln Ala Met Glu Asn

145 150 155 160

Pro Glu Ile Glu Gly Ala Gln Tyr Gln Gln Gly Thr Leu Ala Gly Tyr

165 170 175

Glu Val Arg Glu Tyr Leu Leu Glu Lys Trp Asp Arg Thr Cys Ala Tyr

180 185 190

Cys Gly Ala Lys Asp Val Pro Leu Gln Ile Glu His Ile His Pro Lys

195 200 205

Ser Lys Asn Gly Ser Asn Arg Ile Ser Asn Leu Ala Leu Ala Cys Gln

210 215 220

Cys Cys Asn Gln Lys Lys Ala Ala Leu Pro Val Glu Met Phe Leu Ala

225 230 235 240

Lys Lys Pro Lys Leu Leu Lys Arg Ile Leu Ala Gln Ala Lys Arg Pro

245 250 255

Leu Lys Asp Ala Ala Ala Val Asn Ser Thr Arg Trp Ala Leu Val Asn

260 265 270

Thr Leu Lys Thr Thr Gly Leu Val Val Glu Thr Gly Thr Gly Gly Gln

275 280 285

Thr Lys Phe Asn Arg Ser Gln Phe Asp Ile Pro Lys Thr His Ala Leu

290 295 300

Asp Ala Ala Cys Val Gly Glu Val Gly Ser Ile Thr Asp Trp Gln Lys

305 310 315 320

Pro Thr Leu Ala Ile Lys Ala Met Gly Arg Gly Ser Tyr Gln Arg Thr

325 330 335

Arg Leu Asp Lys Phe Gly Cys Val Arg Gly Tyr Leu Thr Arg Ser Lys

340 345 350

Ser Ile Lys Gly Phe Gln Thr Gly Asp Met Val Lys Asp Glu Val Thr

355 360 365

Thr Gly Lys Lys Ile Gly Ser Tyr Thr Gly Arg Val Ala Val Arg Thr

370 375 380

Ser Gly Ser Phe Asn Ile Gln Thr Ser Ala Gly Leu Val Gln Gly Val

385 390 395 400

Ser His Arg Tyr Cys Thr Val Val Gln Arg Gly Asn His Leu Lys His

405 410 415

Glu Ile Lys Val Leu Tyr Asn Ile Asp Tyr Met Ile Glu Arg Ala Glu

420 425 430

<210> 437

<211> 274

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-395 effector

<400> 437

Gln Ala Met Glu Asn Pro Glu Ile Glu Gly Ala Gln Tyr Gln Gln Gly
1 5 10 15

Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys Trp Asp
20 25 30

Arg Thr Cys Ala Tyr Cys Asp Ala Lys Asp Val Pro Leu Gln Val Glu
35 40 45

His Ile Gln Pro Lys Ala Lys Gly Gly Ser Asn Arg Ile Ser Asn Leu
50 55 60

Ala Leu Ala Cys Gln Cys Cys Asn Gln Lys Lys Ala Ala Leu Pro Val
65 70 75 80

Glu Met Phe Leu Ala Lys Lys Pro Glu Leu Leu Lys Arg Ile Leu Ala
85 90 95

Gln Ala Lys Arg Pro Leu Lys Asp Ala Ala Ala Val Asn Ser Thr Arg
100 105 110

Trp Ala Leu Val Asn Ala Leu Lys Ala Thr Gly Leu Pro Val Glu Thr
115 120 125

Ala Ser Gly Gly Gln Thr Lys Phe Asn Arg Ser Gln Phe Asp Ile Pro
130 135 140

Lys Thr His Ala Leu Asp Ala Ala Cys Val Gly Glu Val Gly Ser Ile
145 150 155 160

Thr Asp Trp Gln Lys Pro Thr Leu Ser Ile Lys Ala Met Gly Arg Gly
165 170 175

Ser Tyr Gln Arg Thr Leu Leu Asp Lys Phe Gly Cys Val Arg Gly Tyr
180 185 190

Met Thr Arg Ser Lys Ser Ile His Gly Phe Gln Thr Gly Asp Met Val
195 200 205

Lys Ala Ile Val Leu Lys Gly Lys Lys Ile Gly Thr Tyr Met Gly Arg
210 215 220

Val Ala Val Arg Ala Ser Gly Ser Phe Asn Ile Gln Thr Ser Thr Gly
225 230 235 240

Leu Val Gln Gly Val Ser His Arg Tyr Cys Thr Val Val Gln Arg Gly

245 250 255

Asn Gly Tyr Gly Tyr Ser Leu Val Ala Lys Thr Asp Val Arg Gly Thr
260 265 270
Pro Pro

<210> 438
<211> 88
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-396 effector
<400> 438
Gln Asp Leu Leu Val Tyr Gly Arg Ala Ala Val Tyr Arg Leu Gln Pro
1 5 10 15
Phe Thr Ile Val Leu Lys Asp Arg Ala Ala Gly Asp Val Gln Pro Val

20 25 30
Glu Phe Lys Val Asp Pro Gly Ser Lys Val Thr Gly Leu Ala Leu Val
35 40 45
Ala Glu Phe Glu Lys Arg Gly Arg Thr Val Val Trp Ala Ala Asn Leu
50 55 60
Ala His Arg Gly His Arg Val Lys Ala Ser Met Thr Asp Arg Ala Met
65 70 75 80
Phe Arg Arg Gly Arg Arg Gly Arg
85

<210> 439
<211> 319
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-397 effector

<400> 439

Gln His Arg Val Asp Thr Val Leu Ser Trp Val Thr Arg Leu Arg Arg
1 5 10 15

Ala Met Pro Val Thr Ser Met Ala Thr Glu Leu Val Arg Phe Asp Met
20 25 30

Gln Leu Leu Glu Asn Pro Glu Ile Ser Gly Ile Glu Tyr Gln Asn Gly
35 40 45

Thr Leu Ala Gly Thr Glu Leu Arg Glu Tyr Leu Leu Asn Lys Trp Glu
50 55 60

Arg Arg Cys Ala Tyr Cys Asp Ala Gln Asn Val Pro Leu Asn Ile Asp
65 70 75 80

His Val Val Pro Arg Ala Ser Gly Gly Ser Asn Arg Val Ser Asn Leu
85 90 95

Thr Leu Ala Cys Ile Pro Cys Asn Glu Arg Lys Gly Ala Gln Pro Val
100 105 110

Glu Val Phe Leu Ala Arg Asp Thr Lys Arg Leu Ala Lys Ile Lys Ser
115 120 125

Gly Leu Lys Arg Pro Leu Lys Asp Ala Ala Ala Val Asn Ala Thr Arg
130 135 140

Trp Ala Leu Phe Asn Arg Leu Lys Gln Ala Gly Leu Pro Val Ser Thr
145 150 155 160

Gly Ser Gly Gly Arg Thr Lys Trp Asn Arg Ser Arg Leu Gly Ile Pro
165 170 175

Lys Thr His Ala Leu Asp Ala Ala Cys Val Gly Glu Val Asp Ala Leu
180 185 190

Ser Asp Trp Asp Met Pro Ser Leu Ser Ile Lys Ala Thr Gly Arg Gly
195 200 205

Ser Tyr Cys Arg Thr Arg Leu Asp Lys Phe Gly Phe Pro Arg Gly Tyr
210 215 220

Leu Thr Arg Glu Lys Arg Ile Lys Gly Phe Gln Thr Gly Asp Met Val

225 230 235 240

Lys Ala Val Leu Ala Lys Gly Val His Val Gly Thr Trp Ile Gly Arg

245 250 255

Val Ala Val Arg Ala Thr Gly Ser Phe Asn Ile Gln Thr Ala Ser Gly

260 265 270

Val Arg Gln Gly Ile Gly Trp Lys Val Cys Arg Val Ile Gln Arg Ala

275 280 285

Asp Gly Tyr Gly Tyr Ser Thr Thr Pro Thr Glu Lys Lys Gly Ala Ala

290 295 300

Ser Ser Pro Cys Leu Lys Ala Gly Val Ser Ala Ala Lys Ser Gln

305 310 315

<210> 440

<211> 391

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-398 effector

<400> 440

Gln Pro Leu Arg Leu Lys Leu Asp Pro Gly Ser Lys Val Thr Gly Leu

1 5 10 15

Ala Ile Val Arg Glu Ala Gly Ala Thr His His Val Leu His Leu Thr

20 25 30

Glu Leu His His Arg Gly Ala Ser Ile Arg Lys Ala Leu Gln Gln Arg

35 40 45

Lys Asn Tyr Arg Arg Gly Arg Arg Ser Arg Asn Leu Arg Tyr Arg Ala

50 55 60

Pro Arg Phe Leu Asn Arg Arg Arg Ala Asp Gly Trp Leu Ala Pro Ser

65 70 75 80

Leu Gln His Arg Met Val Thr Thr Glu Thr Trp Val Lys Arg Tyr Arg
85 90 95
Ser Leu Ala Pro Ile Val Ala Leu Thr Val Glu Arg Val Arg Phe Asp
100 105 110
Leu Gln Gln Met Val Thr Pro Glu Ile Ser Gly Val Glu Tyr Gln Gln
115 120 125
Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys Trp
130 135 140

Gly Arg Thr Cys Val Tyr Cys Asp His Thr Asp Arg Pro Leu Gln Val
145 150 155 160
Glu His Leu Thr Pro Thr Gly Ser Gly Gly Ser Asp Gln Val Ser Asn
165 170 175
Leu Ala Leu Ala Cys Glu Ser Cys Asn Ala Ala Lys Gly Asn Gln Thr
180 185 190
Val Glu Val Tyr Leu Ala Asp Asp Pro Val Arg Arg Asp Arg Ile Leu
195 200 205

Arg Gln Ala Gln Gln Pro Leu Arg Asp Ala Ala Ala Val Asn Ala Thr
210 215 220
Arg Trp Ala Ile Trp Glu Met Leu Thr Arg Thr Gly Val Pro Val Glu
225 230 235 240
Ala Thr Thr Gly Gly Arg Thr Lys Trp Asn Arg Thr Arg Met Gly Ile
245 250 255
Pro Lys Arg Asp Ala Trp Asp Ala Ala Cys Ala Gly Thr Val Asp Gln
260 265 270

Val Leu Gly Trp Asp Arg Pro Ile Gln Arg Val Asp Cys Leu Gly Arg
275 280 285
Gly Ser His Gln Arg Thr Arg Val Thr Lys Asp Gly Phe Pro Arg Gly
290 295 300
Tyr Leu Pro Arg Thr Lys Met Val Gln Gly Phe Arg Thr Gly Asp His
305 310 315 320
Val Arg Ala Ile Val Glu Thr Gly Ala His Arg Gly Thr Trp Thr Gly

325 330 335

Arg Val Ala Val Arg Ser Thr Gly Ser Phe Asn Ile Gln Thr Gly Ala
340 345 350
Ala Thr Ile Gln Gly Ile Ala Ala Arg Trp Cys Val Leu Leu Gln Arg
355 360 365
Gly Asp Gly Tyr Arg Tyr Ser Leu Ala Leu Pro Arg Thr Glu His Ala
370 375 380
Ile Arg Pro Ser Ser Val Ala
385 390

<210> 441
<211> 342
<212> PRT
<213> Unknown
<
220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-399 effector
<400> 441
Arg Gln Ile Ser Glu Ala Leu Thr Ala Arg Arg Arg Met Arg Arg Ala
1 5 10 15
Arg Arg Gly Arg Lys Thr Arg Tyr Arg Ala Pro Arg Phe Leu Asn Arg
20 25 30
Arg Arg Ala Pro Gly Trp Ile Ala Pro Ser Leu Gln His Arg Val Asp
35 40 45

Thr Thr Ile Ala Trp Val Ala Arg Leu Arg Lys Leu Ser Pro Val Val
50 55 60
Gly Ile Val Gln Glu Leu Val Arg Phe Asp Met Gln Ala Met Glu Ser
65 70 75 80
Pro Gly Ile Glu Gly Ala Gln Tyr Gln Arg Gly Glu Leu Ala Gly Tyr
85 90 95
Glu Val Arg Glu Tyr Leu Leu Glu Lys Trp Gly Arg Gln Cys Ala Tyr

100 105 110

Cys Asp Ile Gln Asp Val Pro Met Gln Ile Glu His Ile Val Pro Leu
115 120 125
Ala Ser Gly Gly Ser Asn Arg Val Ser Asn Leu Thr Leu Ala Cys Gly
130 135 140
Pro Cys Asn Gln Lys Lys Ala Ala Leu Pro Leu Glu Leu Phe Leu Lys
145 150 155 160
Lys Asp Leu Ala Arg Ala Ala Arg Ile Lys Ala Gln Cys Lys Arg Pro
165 170 175

Leu Lys Asp Ala Ala Val Val Asn Ser Thr Arg Trp Val Leu Phe Asn
180 185 190
Thr Leu Lys Ala Thr Gly Leu Pro Val Glu Val Ala Ser Gly Gly Arg
195 200 205
Thr Lys Phe Asn Arg Thr Ala Leu Gly Val Pro Lys Ser His Ala Leu
210 215 220
Asp Ala Ala Cys Val Gly Glu Val Lys Ala Ile Ser Gly Trp Asp Arg
225 230 235 240

Gln Thr Leu Ala Ile Lys Cys Val Gly Arg Gly Ala Tyr Gln Arg Thr
245 250 255
Arg Leu Asn Ala Gly Gly Gly Val Arg Gly Tyr Leu Met Arg Gln Lys
260 265 270
Arg Val His Gly Phe Ala Thr Gly Asp Met Val Arg Ala Val Ile Ala
275 280 285
Ser Gly Lys Asn Ala Gly Thr His Ser Gly Arg Val Ala Val Arg Lys
290 295 300

Thr Gly Ser Phe Ala Ile Ala Thr Pro Thr Gly Lys Leu Asp Gly Val
305 310 315 320
Ser Trp Arg His Leu Ser Met Val Gln Arg Ala Asp Gly Tyr Gly Tyr
325 330 335
Ser Ile Glu Arg Thr His
340

<210> 442

<211> 189

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-400 effector

<400> 442

Arg Arg Asp Arg Ile Leu Arg Gln Ala Gln Gln Pro Leu Arg Asp Ala
1 5 10 15

Ala Ala Val Asn Ala Thr Arg Trp Ala Ile Trp Glu Met Leu Thr Arg
20 25 30

Thr Gly Val Pro Val Glu Ala Thr Thr Gly Gly Arg Thr Lys Trp Asn
35 40 45

Arg Thr Arg Met Gly Ile Pro Lys Arg Asp Ala Trp Asp Ala Ala Cys
50 55 60

Ala Gly Thr Val Asp Gln Val Leu Gly Trp Asp Arg Pro Ile Gln Arg
65 70 75 80

Val Asp Cys Leu Gly Arg Gly Ser His Gln Arg Thr Arg Val Thr Lys
85 90 95

Asp Gly Phe Pro Arg Gly Tyr Leu Pro Arg Thr Lys Met Val Gln Gly
100 105 110

Phe Arg Thr Gly Asp His Val Arg Ala Ile Val Glu Thr Gly Ala His
115 120 125

Arg Gly Thr Trp Thr Gly Arg Val Ala Val Arg Ser Thr Gly Ser Phe
130 135 140

Asn Ile Gln Thr Gly Ala Ala Thr Ile Gln Gly Ile Ala Ala Arg Trp
145 150 155 160

Cys Val Leu Leu Gln Arg Gly Asp Gly Tyr Arg Tyr Ser Leu Ala Leu
165 170 175

Pro Arg Thr Glu His Ala Ile Arg Pro Ser Ser Val Ala

180 185

<210> 443

<211> 169

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-401 effector

<400> 443

Arg Thr Lys Trp Asn Arg Ser Trp Leu Gly Ile Pro Lys Arg Asp Ala
1 5 10 15

Trp Asp Ala Ala Cys Ala Gly Thr Ile Glu Gln Val Val Gly Trp Asp
20 25 30

Arg Pro Ile Gln Arg Ile Asp Cys Leu Gly Arg Gly Ser His Gln Arg
35 40 45

Thr Arg Val Thr Lys Asp Gly Phe Pro Arg Gly Tyr Leu Pro Arg Thr
50 55 60

Lys Met Val Arg Gly Phe Arg Thr Gly Asp His Val Arg Ala Thr Val
65 70 75 80

Pro Thr Gly Lys Lys Thr Gly Thr Trp Ile Gly Arg Val Ala Val Arg
85 90 95

Thr Thr Gly Ser Phe Asp Ile Gln Thr Val Ala Lys Thr Val Gln Gly
100 105 110

Ile Ser Ala Arg Trp Cys Val Leu Leu Gln Arg Gly Asp Gly Tyr Arg
115 120 125

Tyr Ser Arg Val Glu Ser Glu Pro Pro Leu Ala Val Arg Pro Ser Ser
130 135 140

Arg Arg Pro Lys Ala Thr Leu Ser Gly Pro Arg Val Ser Leu Val Thr
145 150 155 160

Thr Arg Ser Leu Glu Gly Ser Gly Arg

165

<210> 444

<211> 364

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-402 effector

<400> 444

Arg Val His Arg Leu Val Pro Phe Thr Ile Arg Leu Val Asp Arg Arg
1 5 10 15

Val Glu Thr Ser Val Leu Gln Pro Leu Arg Leu Lys Leu Asp Pro Gly
20 25 30

Ser Lys Val Thr Gly Val Ala Val Val Arg Glu Ala Gly Asp Thr His
35 40 45

His Val Leu His Leu Thr Glu Leu His His Arg Gly Ala Ser Ile Arg
50 55 60

Lys Thr Leu Gln Gln Arg Lys Asn Tyr Arg Arg Gly Arg Arg Thr Arg
65 70 75 80

Asn Leu Arg His Arg Ala Pro Arg Phe Leu Asn Arg Arg Arg Pro Glu
85 90 95

Gly Trp Leu Ala Pro Ser Leu Leu His Arg Val Val Thr Thr Glu Thr
100 105 110

Trp Val Lys Arg Tyr Arg Ala Leu Ala Pro Ile Val Ala Leu Thr Val
115 120 125

Glu Arg Val Arg Phe Asp Met Gln Gln Met Val Ser Pro Glu Ile Ser
130 135 140

Gly Ile Ala Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu
145 150 155 160

Tyr Leu Leu Glu Lys Trp Gly Arg Thr Cys Val Tyr Cys Asp Arg Thr

165 170 175

Asp Arg Pro Leu Gln Val Glu His Leu Thr Pro Gln Gly Ser Gly Gly

180 185 190

Ser Asp Arg Ile Ser Asn Leu Ala Leu Ala Cys Gln Pro Cys Asn Glu

195 200 205

Ala Lys Gly Asn Gln Thr Val Glu Val Tyr Leu Ile Ser Asp Pro Ile

210 215 220

Arg Arg Asp Arg Ile Leu Arg Gln Ala Gln Gln Pro Leu Arg Asp Ala

225 230 235 240

Ala Ala Val Asn Ala Thr Arg Trp Ala Ile Trp Glu Met Leu Thr Arg

245 250 255

Thr Gly Leu Ala Val Glu Ala Thr Thr Gly Gly Arg Thr Lys Trp Asn

260 265 270

Arg Ala Arg Met Gly Ile Pro Lys Arg Asp Ala Trp Asp Ala Ala Cys

275 280 285

Ala Gly Thr Val Asp Gln Ile Leu Gly Trp Asp Arg Pro Ile Gln Arg

290 295 300

Ile Asp Cys Leu Gly Arg Gly Ser His Gln Arg Thr Arg Val Thr Lys

305 310 315 320

Asp Gly Phe Pro Arg Gly Tyr Leu Pro Arg Thr Lys Thr Gly His Gly

325 330 335

Phe Arg Thr Gly Asp His Val Arg Ala Ile Val Pro Thr Gly Lys Lys

340 345 350

Thr Gly Thr Trp Ala Gly Arg Val Ala Val Arg Thr

355 360

<210> 445

<211> 380

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-403 effector

<400> 445

Ser Lys Ala Thr Gly Ile Ala Leu Val Arg Glu Thr Glu Gly Lys Gly
1 5 10 15
Val Ala Val Val Asn Leu Phe Glu Leu Val His Arg Gly Arg Gln Ile
20 25 30

Ser Glu Ala Leu Thr Ala Arg Arg Gly His Arg Arg Leu Arg Arg Ser
35 40 45
Lys Leu Arg Tyr Arg Pro Pro Arg Phe Asn Asn Arg Gly Asn Gln Lys
50 55 60
Lys Gly Trp Leu Pro Pro Ser Leu Gln His Arg Val Asp Thr Ser Met
65 70 75 80
Ala Trp Val Ser Arg Ile Gln Arg Leu Ala Pro Val Ser Ala Ile Ser
85 90 95

Thr Glu Leu Val Arg Phe Asp Met Gln Ala Met Glu Asn Pro Glu Ile
100 105 110
Glu Gly Ala Gln Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg
115 120 125
Glu Tyr Leu Phe Glu Lys Trp Lys Arg Thr Cys Ala Tyr Cys Gly Ala
130 135 140
Lys Asp Val Pro Leu His Val Glu His Ile Gln Pro Lys Ala Lys Gly
145 150 155 160

Gly Ser Asn Arg Ile Ser Asn Leu Ala Leu Ala Cys Gln Cys Cys Asn
165 170 175
Gln Lys Lys Ala Ala Leu Pro Val Glu Met Phe Leu Ala Lys Lys Pro
180 185 190
Glu Leu Leu Lys Arg Ile Leu Ala Gln Ala Lys Arg Pro Leu Lys Asp
195 200 205
Ala Ala Ala Val Asn Ser Thr Arg Trp Ala Leu Val Asn Ala Leu Lys
210 215 220

Ala Thr Gly Leu Pro Val Glu Thr Ala Ser Gly Gly Gln Thr Lys Phe

225 230 235 240

Asn Arg Ser Gln Phe Asp Ile Pro Lys Thr His Ala Leu Asp Ala Ala

245 250 255

Cys Val Gly Glu Val Gly Ser Ile Thr Asp Trp Gln Lys Pro Thr Leu

260 265 270

Ala Ile Lys Ala Met Gly Arg Gly Ser Tyr Gln Arg Thr Arg Leu Asp

275 280 285

Lys Phe Gly Cys Val Arg Gly Tyr Leu Thr Arg Ser Lys Ser Ile Lys

290 295 300

Gly Phe Gln Thr Gly Asp Leu Val Arg Ala Glu Val Thr Lys Gly Lys

305 310 315 320

Lys Ile Gly Ser Tyr Thr Gly Arg Val Ala Val Arg Ala Thr Gly Ser

325 330 335

Phe Asn Ile Gln Thr Ser Thr Gly Leu Val Gln Gly Val Ser His Arg

340 345 350

Tyr Cys Thr Val Val Gln Arg Gly Asn Gly Tyr Gly Tyr Ser Leu Val

355 360 365

Ala Lys Asn Gly Arg Asp Arg Tyr Ala Thr Ala Ala

370 375 380

<210> 446

<211> 362

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-404 effector

<400> 446

Ser Lys Thr Thr Gly Ile Ala Leu Lys Gln Gly Asp Lys Ile Ile Phe

1 5 10 15

Gly Ala Glu Leu Thr His Arg Gly Gln Ala Ile Lys Ala Ser Leu Glu

20 25 30

Ser Arg Arg Ser Leu Arg Arg Ser Arg Arg Asn Arg His Thr Arg Tyr
35 40 45
Arg Gln Ala Arg Phe Leu Asn Arg Thr Arg Pro Lys Gly Trp Leu Ala
50 55 60
Pro Ser Leu Gln His Arg Val Glu Thr Thr Leu Thr Trp Val Asn Lys
65 70 75 80

Phe Ile Gln Leu Ala Pro Ile Gly Ser Ile Val Gln Glu Leu Val Arg
85 90 95
Phe Asp Leu Gln Gln Ile Glu Asn Pro Glu Ile Ser Gly Ile Glu Tyr
100 105 110
Gln Gln Gly Glu Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu Leu Asn
115 120 125
Lys Trp Asp Arg Lys Cys Ala Tyr Cys Ser Ala Glu Asn Ile Pro Leu
130 135 140

Gln Val Glu His Ile His Pro Lys Ala Lys Gly Gly Ser Asn Arg Ile
145 150 155 160
Ser Asn Leu Cys Leu Ala Cys Glu Lys Cys Asn Leu Lys Lys Gly Thr
165 170 175
Gln Asp Ile Glu Val Phe Leu Ala Lys Lys Pro Asp Leu Leu Lys Arg
180 185 190
Ile Leu Ser Gln Ala Lys Arg Pro Leu Lys Asp Ala Ala Ala Val Asn
195 200 205

Ser Thr Arg Trp Ala Leu Leu Asn Arg Leu Gln Glu Thr Gly Leu Pro
210 215 220
Val Leu Thr Gly Ser Gly Gly Gln Thr Lys Phe Asn Arg Thr Arg Leu
225 230 235 240
Asp Leu Pro Lys Thr His Trp Leu Asp Ala Ala Cys Val Gly His Val
245 250 255
Asp Glu Leu Glu Val Leu Thr Gly Lys Pro Leu Leu Ile Lys Ala Thr
260 265 270

Gly His Gly Ser Arg Gln Met Cys Gly Thr Asp Lys Phe Gly Phe Pro

275 280 285

Ser Arg His Arg Thr Arg Lys Gln Ile His Gln Gly Phe Gln Thr Gly

290 295 300

Asp Ile Val Lys Ala Leu Val Thr Ser Gly Lys Lys Ile Gly Ser Tyr

305 310 315 320

Val Gly Arg Val Leu Cys Arg Ala Ser Gly Ser Phe Asp Ile Gln Val

325 330 335

Lys Ser Gly Arg Val Gln Gly Leu Ser His Lys Phe Cys Arg Ser Val

340 345 350

His Arg Lys Asp Gly Tyr Gly Tyr Gly Phe

355 360

<210> 447

<211> 306

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-405 effector

<400> 447

Ser Thr Glu Leu Val Arg Phe Asp Met Gln Ala Met Glu Asn Pro Glu

1 5 10 15

Ile Glu Gly Met Gln Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val

20 25 30

Arg Glu Tyr Leu Leu Glu Lys Trp Asp Arg Thr Cys Ala Tyr Cys Gly

35 40 45

Ala Lys Asp Val Pro Leu Gln Val Glu His Ile Gln Pro Lys Ala Lys

50 55 60

Gly Gly Ser Asn Arg Ile Ser Asn Leu Ala Leu Ala Cys Gln Cys Cys

65 70 75 80

Asn Gln Lys Lys Ala Ala Leu Pro Val Glu Met Phe Leu Ala Lys Lys

85 90 95

Pro Glu Leu Leu Lys Arg Ile Leu Ala Gln Ala Lys Arg Pro Leu Lys
100 105 110
Asp Ala Ala Ala Val Asn Ser Thr Arg Trp Ala Leu Val Asn Thr Leu
115 120 125
Lys Thr Thr Gly Leu Val Val Glu Thr Ala Ser Asp Gly Gln Thr Lys
130 135 140

Phe Asn Arg Asn Gln Leu Gly Ile Pro Lys Thr His Ala Leu Asp Ala
145 150 155 160
Ala Cys Val Gly Glu Val Gly Ser Ile Thr Asp Trp Gln Lys Pro Thr
165 170 175
Leu Ala Ile Lys Ala Met Gly Arg Gly Ser Tyr Gln Arg Thr Arg Leu
180 185 190
Asp Lys Phe Gly Cys Val Arg Gly Tyr Leu Thr Arg Ser Lys Ser Ile
195 200 205

Lys Gly Phe Gln Thr Gly Asp Met Val Lys Ala Glu Val Thr Thr Gly
210 215 220
Lys Lys Ile Gly Ser Tyr Thr Gly Arg Val Ala Val Arg Ala Thr Gly
225 230 235 240
Ser Phe Asn Ile Gln Thr Ser Thr Gly Leu Val Gln Gly Val Ser His
245 250 255
Arg Tyr Cys Thr Val Val Gln Arg Gly Asn Gly Tyr Gly Tyr Ser Leu
260 265 270

Val Ala Lys Thr Asp Val Arg Gly Thr Pro Pro Gln His Arg Asp Ala
275 280 285
Ser His Pro Ala Leu Tyr Leu Pro Gly Leu Lys Ala Glu Val Ser Arg
290 295 300
Ala Asn
305
<210> 448
<211> 193
<212> PRT
<213> Unknown

<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-406 effector
<400> 448

Ser Val Leu Asn Gln Ile Ile Pro His Leu Leu Glu Tyr Leu Gly Asp

1 5 10 15

Glu Thr Leu Tyr Asp Val Tyr Ala Thr Asp Gly Arg Ser Thr Lys Gly
20 25 30

Phe Arg Ile Ala Lys Asn Val Pro Lys Glu His Tyr Thr Asp Ala Tyr
35 40 45

Cys Val Ala Cys Ser Ile Leu Asp Thr Asp Ile Asp Val Ser Ala Pro
50 55 60

Ala Glu Pro Phe Glu Leu Lys Gln Phe Arg Arg His Asp Arg Gln Ala

65 70 75 80

Cys Ile Arg Gln Met Val Asp Arg Lys Tyr Leu Leu Asp Gly Lys Val
85 90 95

Val Ala Thr Asn Arg His Lys Ala Ile Glu Gln Lys Ser Asp Ser Leu
100 105 110

Glu Glu Phe Arg Glu Ala Tyr Gly Asp Ala Ala Val Ser Gln Leu Thr
115 120 125

Val Lys Pro His Pro Pro Gln Tyr Lys Asp Met Thr Arg Ile Met Pro

130 135 140

Gly Ala Val Met Asp Phe Asn Gly Thr Ile Gly Val Met Gln Ser Ser
145 150 155 160

Ile Val Gly Arg Phe Tyr Lys Ser Thr Lys Gly Tyr Lys Ala Thr Pro
165 170 175

Arg Arg Cys Val Leu Leu Ala Gln Asn Ala Gly Met Val Phe Leu Pro
180 185 190

Ala

<210> 449

<211> 369

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-408 effector

<400> 449

Thr Glu Ala Leu Ile Gly Arg Arg Gly His Arg Arg Leu Arg Arg Ser
1 5 10 15

Lys Leu Arg Tyr Arg Ala Pro Arg Phe Asn Asn Arg Gly Asn Gln Lys
20 25 30

Lys Gly Trp Leu Pro Pro Ser Leu Gln His Leu Val Asn Thr Ser Leu
35 40 45

Glu Trp Val Lys Arg Ile Glu Lys Leu Ala Pro Ile Ser Gly Ile Ser
50 55 60

Thr Glu Leu Val Arg Phe Asp Met Gln Ala Met Glu Asn Pro Lys Ile
65 70 75 80

Glu Gly Met Gln Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg
85 90 95

Glu Tyr Leu Leu Glu Lys Trp Lys Arg Thr Cys Ala Tyr Cys Asp Ala
100 105 110

Lys Asp Val Pro Leu Gln Val Glu His Ile Gln Pro Lys Ala Lys Gly
115 120 125

Gly Ser Asn Arg Ile Ser Asn Leu Ala Leu Ala Cys Pro Ser Cys Asn
130 135 140

Ser Lys Lys Ala Ala Leu Pro Ile Glu Ser Phe Leu Ser Lys Gln Pro
145 150 155 160

Glu Arg Leu Lys Arg Ile Gln Val Gln Ala Lys Arg Pro Leu Lys Asp
165 170 175

Ala Ala Ala Val Asn Ser Thr Arg Trp Ala Leu Val Asn Ala Leu Lys

180 185 190

Ala Thr Trp Leu Pro Val Glu Thr Ala Ser Gly Gly Lys Thr Lys Phe

195 200 205

Asn Arg Asn Gln Leu Gly Ile Pro Lys Thr His Ala Leu Asp Ala Val

210 215 220

Cys Val Gly Asn Ile Ser Thr Val Thr Asp Trp Gln Lys Pro Thr Leu

225 230 235 240

Ser Ile Lys Ala Met Gly Arg Gly Ser Tyr Gln Arg Thr Arg Leu Asp

245 250 255

Lys Phe Gly Cys Val Arg Gly Tyr Met Thr Arg Ser Lys Ser Ile His

260 265 270

Gly Phe Gln Thr Gly Asp Met Val Lys Ala Ile Val Leu Lys Gly Lys

275 280 285

Lys Ile Gly Thr Tyr Met Gly Arg Val Ala Val Arg Ala Ser Gly Ser

290 295 300

Phe Asn Ile Gln Thr Gly Asn Gly Leu Val Gln Gly Val Ser His Arg

305 310 315 320

Tyr Cys Thr Val Val Gln Arg Gly Asp Gly Tyr Gly Tyr Ser Leu Val

325 330 335

Ala Lys Thr Asp Val Arg Gly Thr Pro Pro Gln His Arg Asp Ala Ser

340 345 350

His Pro Ala Leu Tyr Leu Pro Gly Leu Lys Ala Glu Val Ser Arg Ala

355 360 365

Asn

<210> 450

<211> 107

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-409 effector

<400> 450

Thr Arg Lys Lys Arg Val His Gly Phe Gln Thr Gly Asp Arg Val Arg
1 5 10 15

Ala Ile Val Pro Lys Gly Lys Lys Ala Gly Ala Tyr Val Gly Arg Val
20 25 30

Ala Ile Arg Ala Thr Gly Ser Phe Asn Ile Gln Thr Pro Thr Gly Val
35 40 45

Val Gln Gly Ile Ala His Arg His Cys Thr Met Val Leu Arg Ala Asp
50 55 60

Gly Tyr Gly Tyr Ser Thr Val Pro Leu Thr Lys Glu Gly Asn Ser Gly
65 70 75 80

Asn Gly Thr Lys Ala Trp Leu Ala Ala Gln Ala Val Leu Ser Leu Pro
85 90 95

Gly Met Asn Ala Glu Val Ser Arg Ala Asn Gly
100 105

<210> 451

<211> 325

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-410 effector

<400> 451

Thr Ser Met Ala Trp Val Ser Arg Ile Gln Arg Leu Ala Pro Val Ser
1 5 10 15

Ala Ile Ser Thr Glu Leu Val Arg Phe Asp Ala Gln Ala Leu Glu Asn
20 25 30

Pro Glu Ile Glu Gly Ala Gln Tyr Gln Gln Gly Thr Leu Ala Gly Tyr
35 40 45

Glu Val Arg Glu Tyr Leu Leu Glu Lys Trp Asp Arg Thr Cys Ala Tyr

50 55 60

Cys Gly Ala Lys Asp Val Pro Leu Gln Val Glu His Ile Gln Pro Lys

65 70 75 80

Ala Lys Gly Gly Ser Asn Arg Ile Ser Asn Leu Ala Leu Ala Cys Gln

85 90 95

Cys Cys Asn Gln Lys Lys Ala Ala Leu Pro Val Glu Met Phe Leu Ala

100 105 110

Lys Lys Pro Lys Leu Leu Lys Arg Ile Leu Ala Gln Ala Lys Arg Pro

115 120 125

Leu Lys Asp Ala Ala Ala Val Asn Ser Thr Arg Trp Ala Leu Val Asn

130 135 140

Ala Leu Lys Ala Thr Gly Leu Pro Val Glu Thr Ala Ser Gly Gly Gln

145 150 155 160

Thr Lys Phe Asn Arg Asn Gln Leu Gly Ile Pro Lys Thr His Ala Leu

165 170 175

Asp Ala Ala Cys Val Gly Glu Val Gly Ser Ile Thr Asp Trp Gln Lys

180 185 190

Pro Thr Leu Ala Ile Lys Ala Met Gly Arg Gly Ser Tyr Gln Arg Thr

195 200 205

Arg Leu Asp Lys Phe Gly Cys Val Arg Gly Tyr Met Thr Arg Ser Lys

210 215 220

Ser Ile His Gly Phe Gln Thr Gly Asp Met Val Lys Ala Glu Val Thr

225 230 235 240

Lys Gly Lys Lys Ile Gly Thr Tyr Met Gly Arg Val Ala Val Arg Ala

245 250 255

Ser Gly Ser Phe Asn Ile Gln Thr Gly Asn Gly Leu Val Gln Gly Val

260 265 270

Ser His Arg Tyr Cys Thr Val Val Gln Arg Gly Asn Gly Tyr Gly Tyr

275 280 285

Ser Leu Val Ala Lys Met Asp Val Arg Gly Thr Leu Pro Gln His Arg

290 295 300

Asp Ala Lys His Pro Ala Leu Tyr Leu Pro Gly Leu Lys Ala Gly Val

305 310 315 320

Ser Arg Ala Lys Arg

325

<210> 452

<211> 355

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-411 effector

<400> 452

Val Ala Glu Phe Glu Gln Arg Gly Arg Thr Val Val Trp Ala Ala Asn

1 5 10 15

Leu Ala His Arg Gly His Arg Val Lys Ala Ser Met Thr Asp Arg Ala

20 25 30

Met Phe Arg Arg Gly Arg Arg Gly Arg Lys Thr Arg Tyr Arg Ala Ala

35 40 45

Arg Phe Glu Asn Arg Thr Arg Pro Thr Asn Trp Leu Ala Pro Ser Leu

50 55 60

Gln Ser Arg Val Leu Asn Val Lys Ser Trp Tyr Ser Arg Leu Leu Ser

65 70 75 80

Arg Ala Ser Ile Ser Val Ala Gln Val Glu Thr Ser Ser Phe Asp Thr

85 90 95

Gln Leu Met Glu Asn Ala Asp Ile Ser Gly Val Glu Tyr Gln Gln Gly

100 105 110

Glu Leu Gln Gly Tyr Glu Val Arg Gln Tyr Val Leu Glu Arg Gly Gly

115 120 125

His Thr Cys Ser Tyr Cys Asp Ala Lys Asp Val Ala Leu His Leu Asp

130 135 140

His Val Leu Pro Arg Ser Arg Gly Gly Ser Asn Arg Val Ser Asn Leu

145 150 155 160

Val Pro Ala Cys Lys Pro Cys Asn Asp Ala Lys Ser Asn Arg Ala Val

165 170 175

Glu Asp Tyr Leu Val Asp Arg Pro Glu Val Leu Arg Gln Val Lys Ala

180 185 190

Gln Leu Arg Ser Pro Leu Lys Asp Ala Ala Val Met Asn Ala Thr Arg

195 200 205

Phe Ala Ile Val Asp Ala Leu Arg Asp Phe Gly Leu Glu Val Gln Met

210 215 220

Trp Ser Gly Gly Arg Thr Lys Trp Asn Arg Thr Asn Leu Gly Leu Pro

225 230 235 240

Lys Asp His Trp Ile Asp Ala Ala Cys Val Gly Glu Thr Gly Ala Ala

245 250 255

Val Arg Val Pro Ala Leu Arg Pro Leu Thr Ile Thr Ala Met Gly Arg

260 265 270

Gly His Arg Arg Val His Gly Asn Asp Arg Tyr Gly Phe Pro Arg Gly

275 280 285

Thr Ala Arg Arg Ala Lys Arg Val Ala Gly Phe Gln Thr Gly Asp Leu

290 295 300

Val Arg Leu Val Cys Leu Gly Gly Lys Ser Ala Gly Ile His Thr Gly

305 310 315 320

Arg Leu Ser Ser Ile Arg Thr Arg Gly Gln Phe Val Leu Gly Lys His

325 330 335

Asp Arg Pro Ala Arg Glu Phe Thr Leu Leu Gln Arg Ser Asp Gly Tyr

340 345 350

Ala Tyr Gly

355

<210> 453

<211> 492

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-412 effector

<400> 453

Val Ala Ile Cys Lys Asp Arg Ser Arg Leu Leu Thr Phe Pro Arg Gly
1 5 10 15

Asp Trp Ser Gln Gly Gln Arg Asn Lys Ser Arg Lys Gly Glu Arg Phe
20 25 30

Glu Met Ala Val Phe Val Leu Asp Arg Ser Gly Arg Pro Leu Met Pro
35 40 45

Cys Thr Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Gly Arg Ala Cys
50 55 60

Val His Leu Val Met Pro Phe Thr Ile Arg Ile Val Asp Leu Lys Ala
65 70 75 80

Glu Asn Cys Ala Phe Gln Ala Leu Arg Val Lys Leu Asp Pro Gly Ser
85 90 95

Lys Ala Thr Gly Ile Ala Leu Val Arg Glu Thr Glu Gly Lys Gly Val
100 105 110

Ala Val Val Asn Leu Phe Glu Leu Val His Arg Gly Arg Gln Ile Ser
115 120 125

Glu Ala Leu Thr Ala Arg Arg Gly His Arg Arg Leu Arg Arg Ser Lys
130 135 140

Leu Arg Tyr Arg Pro Pro Arg Phe Asp Asn Arg Gly Asn Lys Gln Arg
145 150 155 160

Gly Trp Leu Ala Pro Ser Leu Gln His Arg Val Asp Thr Ser Met Ala
165 170 175

Trp Val Ser Arg Ile Gln Arg Leu Ala Pro Val Ser Ala Ile Ser Thr
180 185 190

Glu Leu Val Arg Phe Asp Met Gln Ala Met Glu Asn Pro Glu Ile Glu
195 200 205

Gly Ala Gln Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu

210 215 220

Tyr Leu Leu Glu Lys Trp Asp Arg Thr Cys Ala Tyr Cys Gly Ala Lys
225 230 235 240

Asp Val Pro Leu Gln Ile Glu His Ile His Pro Lys Ser Lys Asn Gly
245 250 255

Ser Asn Arg Ile Ser Asn Leu Ala Leu Ala Cys Gln Cys Cys Asn Gln
260 265 270

Lys Lys Ala Ala Leu Pro Val Glu Met Phe Leu Ala Lys Lys Pro Glu
275 280 285

Leu Leu Lys Arg Ile Leu Ala Gln Ala Lys Arg Pro Leu Lys Asp Ala
290 295 300

Ala Ala Val Asn Ser Thr Arg Trp Ala Leu Val Asn Thr Leu Lys Thr
305 310 315 320

Thr Gly Leu Val Val Glu Thr Gly Thr Gly Gly Gln Thr Lys Phe Asn
325 330 335

Arg Ser Gln Phe Asp Ile Pro Lys Thr His Ala Leu Asp Ala Ala Cys
340 345 350

Val Gly Glu Val Gly Ser Ile Thr Asp Trp Gln Lys Pro Thr Leu Ala
355 360 365

Ile Lys Ala Met Gly Arg Gly Ser Tyr Gln Arg Thr Arg Leu Asp Lys
370 375 380

Phe Gly Cys Val Arg Gly Tyr Leu Thr Arg Ser Lys Ser Ile Lys Gly
385 390 395 400

Phe Gln Thr Gly Asp Met Val Lys Ala Glu Val Thr Thr Gly Lys Lys
405 410 415

Ile Gly Ser Tyr Thr Gly Arg Val Ala Val Arg Ala Thr Gly Ser Phe
420 425 430

Asn Ile Gln Thr Ser Thr Gly Leu Val Gln Ser Val Ser His Arg Tyr
435 440 445

Cys Thr Val Val Gln Arg Gly Asn Gly Tyr Gly Tyr Ser Leu Val Ala
450 455 460

Lys Thr Asp Val Arg Gly Thr Pro Pro Gln His Arg Asp Ala Ser His
465 470 475 480
Pro Ala Leu Tyr Leu Pro Gly Leu Lys Ala Glu Val
485 490

<210> 454
<211> 199
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-413 effector
<400> 454
Val Glu Val Tyr Leu Ala Asp Asp Pro Val Arg Arg Asp Arg Ile Leu
1 5 10 15

Arg Gln Ala Gln Gln Pro Leu Arg Asp Ala Ala Ala Val Asn Ala Thr
20 25 30
Arg Trp Ala Ile Trp Glu Met Leu Thr Lys Thr Gly Leu Asp Val Glu
35 40 45
Ala Thr Thr Gly Gly Arg Thr Lys Trp Asn Arg Ser Arg Leu Gly Ile
50 55 60
Pro Lys Arg Asp Ala Trp Asp Ala Ala Cys Ala Gly Thr Ile Glu Gln
65 70 75 80

Val Val Gly Trp Asp Arg Pro Ile Gln Arg Ile Asp Cys Leu Gly Arg
85 90 95
Gly Ser His Gln Arg Thr Arg Val Thr Lys Asp Gly Phe Pro Arg Gly
100 105 110
Tyr Leu Pro Arg Thr Lys Met Val Arg Gly Phe Arg Thr Gly Asp Arg
115 120 125
Val Arg Ala Thr Val Pro Thr Gly Lys Lys Thr Gly Thr Trp Ile Gly
130 135 140

Arg Val Ala Met Arg Thr Thr Gly Ser Phe Asp Ile Gln Thr Gly Thr

145 150 155 160

Asp Thr Val Gln Gly Ile Ala Ala Arg Cys Cys Thr Leu Leu Gln Arg

165 170 175

Gly Asn Gly Tyr Arg Tyr Ser Leu Ala Leu Pro Arg Thr Glu His Ala

180 185 190

Val Arg Pro Ser Ser Val Ala

195

<210> 455

<211> 161

<212> PRT

<213> Unknown

<220

><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-414 effector

<400> 455

Val Asn Ser Thr Arg Trp Ala Leu Val Asn Ala Leu Lys Ala Thr Gly

1 5 10 15

Leu Pro Val Glu Thr Ala Ser Gly Gly Gln Thr Lys Phe Asn Arg Asn

20 25 30

Gln Leu Gly Ile Pro Lys Thr His Ala Leu Asp Ala Val Cys Val Gly

35 40 45

Asn Ile Asn Thr Val Thr Asp Trp Gln Lys Pro Thr Leu Ser Ile Lys

50 55 60

Ala Met Gly Arg Gly Ser Tyr Gln Arg Thr Arg Leu Asp Lys Phe Gly

65 70 75 80

Cys Val Arg Gly Tyr Met Thr Arg Ser Lys Ser Ile His Gly Phe Gln

85 90 95

Thr Gly Asp Met Val Lys Ala Ile Val Leu Lys Gly Lys Lys Ile Gly

100 105 110

Thr Tyr Met Gly Arg Val Ala Val Arg Ala Ser Gly Ser Phe Asn Ile

115 120 125

Gln Thr Gly Asn Gly Leu Val Gln Gly Val Ser His Arg Tyr Cys Thr
130 135 140
Val Val Gln Arg Gly Asn Gly Tyr Gly Tyr Ser Leu Val Ala Lys Arg
145 150 155 160
Thr

<210> 456
<211> 106
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors
<220><223> Description: MG35-415 effector
<400> 456
Val Thr Gly Ile Ser Gln Glu Leu Val Arg Phe Asp Leu Gln Lys Ile
1 5 10 15
Glu Asn Pro Glu Ile Ala Gly Val Glu Tyr Gln His Gly Thr Leu Ala
20 25 30
Gly Tyr Glu Ile Arg Glu Tyr Leu Leu Glu Lys Trp Ser Arg Thr Cys
35 40 45
Ala Tyr Ser Gly Gln Gly Asp Phe Thr Arg Ser Leu Ser Ala Pro Ser

50 55 60
Lys Gly Arg Arg Leu Gln Val Cys Ser Arg His Thr Gln Pro Lys Gly
65 70 75 80
Gly Arg Thr Pro Pro Arg Arg Lys Arg Arg Gly Trp Lys Ser Arg Ala
85 90 95
Glu Asp Glu Cys Gly His Asp Glu Gly Asp
100 105
<210> 457
<211> 119
<212> PRT
<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors
<220><223> Description: MG35-416 effector
<400> 457

```
Val Thr Lys Asp Gly Phe Pro Arg Gly Tyr Leu Pro Arg Thr Lys Thr
1               5                   10                  15
Gly His Gly Phe Arg Thr Gly Asp His Val Arg Ala Ile Val Pro Thr
            20                  25                  30
Gly Lys Lys Thr Gly Thr Trp Ala Gly Arg Val Ala Val Arg Thr Thr
        35                  40                  45
Gly Ser Phe Asn Ile Gln Thr Val Ala Glu Thr Val Gln Gly Val Ser

    50                  55                  60
Ala Arg Trp Cys Val Leu Leu Gln Arg Gly Asp Gly Tyr Arg Tyr Ser
65                  70                  75                  80
Gln Val Gly Ser Glu Pro Leu Leu Ala Val Arg Pro Ser Ser Arg Arg
                85                  90                  95
Leu Lys Ala Thr Val Ser Gly Pro Leu Ala Pro Asp Val Thr Thr His
            100                 105                 110
Thr Leu Glu Gly Phe Glu Arg
        115
```

<210> 458
<211> 301
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-417 effector
<400> 458

```
Trp Leu Pro Pro Ser Ile Gln Ser Arg Val Asp Asn Val His Ser Trp
1               5                   10                  15
```

Tyr Leu Lys Leu Leu Ala Arg Val Pro Ile Ser Glu Ala His Ile Glu

20 25 30

Thr Val Arg Phe Asp Met Gln Lys Ile Gln Asn Pro Glu Ile Ser Gly

35 40 45

Val Glu Tyr Gln Gln Gly Glu Leu Leu Gly Tyr Glu Ile Arg Glu Tyr

50 55 60

Leu Leu Glu Lys Phe Ser Arg Arg Cys Ala Tyr Cys Gly Ala Lys Asp

65 70 75 80

Val Gln Leu Gln Ile Glu His Ile Lys Pro Lys Ala Leu Gly Gly Thr

85 90 95

Asn Arg Val Ser Asn Leu Thr Leu Ala Cys Glu Pro Cys Asn Leu Arg

100 105 110

Lys Gly Lys Met Pro Ile Glu Asp Phe Leu Arg Lys Lys Pro Asp Leu

115 120 125

Leu Ser Lys Ile Lys Ser Arg Ala Gln Ser Pro Leu Thr Asp Ala Ala

130 135 140

Ser Val Asn Ala Ser Arg Tyr Ala Ile Gly Asp Lys Ile Arg Ser Ile

145 150 155 160

Gly Leu Pro Thr Cys Phe Trp Ser Gly Gly Arg Thr Lys Lys Asn Arg

165 170 175

Val Phe Gln Gly Tyr Ala Lys Asp His Trp Ile Asp Ala Ala Cys Val

180 185 190

Gly Glu Ser Gly Val Ser Val Asn Ile Gly Ser Val Lys Pro Ile Ser

195 200 205

Ile Ser Ala Ile Gly Arg Gly Ser Arg Gln Val Ser Cys Val Asp Lys

210 215 220

Tyr Gly Phe Pro Arg Gly Lys Ala Gly Thr Val Lys Arg Val Phe Gly

225 230 235 240

Phe Ser Thr Gly Asp Phe Val Arg Leu Thr Arg Leu Ser Gly Lys Tyr

245 250 255

Ala Gly Val Trp Val Gly Ile Ile Ala Gly Thr Arg Lys Ser Gly Tyr

260 265 270

Leu Asp Ile Lys Cys Gly Lys Lys Lys Ile Thr Ala Lys His Ser Glu

275 280 285

Phe Arg Leu Leu Asn His Gly Asp Gly Tyr Val Tyr Ala

290 295 300

<210> 459

<211> 242

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-418 effector

<400> 459

Tyr Glu Ile Arg Glu Tyr Leu Leu Asn Lys Trp Glu Arg Lys Cys Thr

1 5 10 15

Tyr Cys Lys Val Glu Asn Ile Pro Leu Gln Val Glu His Ile His Pro

20 25 30

Lys Ala Lys Gly Gly Ser Asn Arg Ile Ser Asn Leu Cys Leu Ala Cys

35 40 45

Glu Lys Cys Asn Leu Lys Lys Gly Thr Gln Asp Ile Asn Asp Phe Leu

50 55 60

Leu Lys Lys Pro Asp Leu Leu Lys Gln Ile Met Ala Gln Val Lys Gln

65 70 75 80

Pro Leu Lys Asp Ala Thr Ala Val Asn Ser Thr Arg Trp Ala Leu Phe

85 90 95

Asn Gln Leu Lys Leu Thr Gly Leu Pro Val Thr Thr Gly Ser Gly Gly

100 105 110

Gln Thr Lys Tyr Asn Arg Thr Arg Leu Glu Leu Pro Lys Thr His Tyr

115 120 125

Phe Asp Ala Ala Cys Val Gly Lys Val Asp Lys Leu Ile Val Leu Thr

130 135 140

Thr Gln Pro Leu Leu Ile Lys Ala Asn Gly His Gly Thr Arg Gln Met
145 150 155 160

Cys Arg Thr Asp Lys Phe Gly Phe Pro Ser Arg Tyr Val Pro Arg Asp
165 170 175
Lys Phe Val Lys Gly Phe Gln Thr Gly Asp Ile Val Lys Ala Val Val
180 185 190
Thr Arg Gly Lys Lys Val Gly Gln Tyr Ile Gly Arg Val Ala Val Arg
195 200 205
Ser Ser Gly Ser Phe Asn Ile Ser Ala Lys Glu Leu Val Gln Gly Ile
210 215 220

Ser His Lys Tyr Cys Gln Thr Leu Gln Arg Lys Asp Gly Tyr Ser Tyr
225 230 235 240
Gln Phe

<210> 460
<211> 68
<212> RNA
<213> Artificial Sequence
<220><223> Description of Artificial Sequence: Synthetic
oligonucleotide
<220><223> Category: MG35 effectors tracrRNA sequence
<220><223> Description: MG35-4 tracrRNA sequence
<400> 460
ggaaaaggug cugaaaggug gugaaauaac accuauauug uuuuuuugag agggagaaaa 60
augcuuuu 68

<210> 461
<211> 72
<212> DNA
<213> Artificial Sequence
<220><223> Description of Artificial Sequence: Synthetic
oligonucleotide
<220><223> Category: putative tracrRNA

<220><223> Description: putative MG35-3 tracrRNA

<400> 461

aggagacggc agtgccgtgt ccctacaata tgatttttgg tagggacacg gcattgccgt 60

ctcctctatc tt 72

<210> 462

<211> 21

<212> DNA

<213> Artificial Sequence

<220><223> Description of Artificial Sequence: Synthetic

oligonucleotide

<220><223> Category: repeat

<220><223> Description: MG35-3 repeat

<400> 462

ggacacggca ctgccgtctc c 21

<210> 463

<211> 988

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG33 effectors

<220><223> Description: MG33-2 effector

<400> 463

Met Pro Ile Thr Glu Lys Leu Arg Val Arg Ile Gly Glu Phe Leu Pro
1 5 10 15

Thr Leu Arg Val Gly Ile Asp Phe Gly Glu His Ala Gly Gly Ile Ala
20 25 30

Leu Val Arg Gly Asn Gln Ile Ile His Ala Glu Thr Tyr Leu Asp Phe
35 40 45

His Glu Ala Thr Leu Glu Glu Arg Arg Lys Leu Arg Arg Gly Arg Arg
50 55 60

Ser Arg Asn Ala Lys Arg Leu Arg Leu Ala Arg Leu Arg Ser Trp Val

65 70 75 80

Leu Arg Gln Arg Val Asn Gly Lys Arg Leu Pro Asp Pro Tyr Ala Val
85 90 95
Met His Asp Pro Arg Phe Met Val Gln Pro Gly Val Tyr Gly Ser Ala
100 105 110
Gly Ala Val Pro Cys Asp Ala Gln Ser Trp Ile Glu Phe Val Lys Glu
115 120 125
Gly Arg Gly Asp Ala Ala Ala Leu Val Arg Ala Ile Thr Leu Ile Phe
130 135 140

Gln Lys Arg Gly Tyr Lys Trp Asp Ala Ile Ala Leu Gly Glu Met Ser
145 150 155 160
Asp Val Lys Leu Lys Asp Phe Leu Leu Thr Ala Arg Met Pro Thr Gly
165 170 175
Asp Ala Ser Leu Ala Glu Gln Val Arg Ala Gln Leu Gln Lys Arg Lys
180 185 190
Asp Asp Pro Glu Asp Pro Val Arg Gly Lys Pro Lys Val Ser Val Glu
195 200 205

Glu Leu Glu Ser Leu Val Ala Leu Ala Cys Lys Arg Gly Glu Leu Pro
210 215 220
Ala Arg Pro Arg Leu Ala Glu His Arg Ser Val Lys Glu Ala Glu Leu
225 230 235 240
Lys Ala Val Ile Glu Gly Phe Glu Thr Ala Ser Gly Leu Gly Asn Asp
245 250 255
Val Ser Asp Arg Trp Lys Lys Glu Leu Cys Gly Leu Leu Asn Lys Val
260 265 270

Leu Arg Pro Ala Arg Phe Glu Asn Arg Leu Lys Thr Gly Cys Ala Trp
275 280 285
Cys Gly Lys Ala Thr Pro Arg Lys Ala Arg Val Arg Glu Ile Ala Tyr
290 295 300
Arg Ala Ala Val Gln Asn Leu Arg Ile Arg Glu Gly Phe Arg Thr Arg
305 310 315 320

Pro Leu Lys Pro Glu Glu Gln Ala Pro Phe Leu Ala Trp Trp Gln Lys
325 330 335

Pro Glu Asp Ala Pro Gly Thr Val Thr Ile Ala Asn Arg Leu Lys Lys
340 345 350
Leu Asn Ser Gly Gln Glu Lys Met Ala Arg Gln Leu Tyr Asp Leu Leu
355 360 365
Lys Asn Pro Asn Ala Lys Gly Arg Ala Ser Leu Cys Ile Glu His Leu
370 375 380
Glu Met Ala Ala Glu Gly Lys Thr Met Lys Asp Ala Gly Val Pro Trp
385 390 395 400

Gln Arg Ile Ala Val Arg Lys Ala Pro Asn Pro Cys Gly Glu Ala Arg
405 410 415
Asp Ala Arg Val Leu Lys Arg Leu Glu Ser Leu Leu Phe Gln Pro Lys
420 425 430
Arg His Gly Asp Lys Ala Trp Arg Tyr Gly Pro Ala Ala Phe Ile Asn
435 440 445
Leu Glu Ile Pro Glu Pro Asp Thr Phe Gln Leu Arg Pro Gly Gln Gln
450 455 460

Ala Glu Arg Lys Val Val Pro Leu Lys Glu Arg Leu Ala Gln Glu Thr
465 470 475 480
Gly Gly Cys Thr Tyr Gly Phe Leu Gly Gly Cys Ala Gly Glu Met Asp
485 490 495
Lys Asp His Ile Phe Pro Arg Ser Leu Gly Gly Pro Asp Val Leu Met
500 505 510
Asn Leu Val Ala Ala Cys Asn Ala His Asn Ala Glu Lys Gly Asn Arg
515 520 525

Thr Pro Cys Gln Trp Leu His Gly Pro Asp Ser Leu His Trp Lys Leu
530 535 540
Phe Gln Glu His Val Arg Asn Leu Pro Leu Ala Glu Ala Lys Lys Arg
545 550 555 560
Ile Leu Leu Ser Leu Asp Ala Gln Gly Asn His Thr Asp Asp Tyr Pro

565 570 575

Glu Asp Asp Pro Thr Pro Leu Ala Arg Ile Gly Ala Arg Pro Arg Gln

580 585 590

Phe Val Val Lys Leu Gly Glu Leu Phe Ala Arg Tyr Gly Val Glu Pro

595 600 605

Pro Arg Ile Tyr Tyr Glu Leu Gly Lys Pro Leu Met Gln Arg Ile Arg

610 615 620

Gly Ser Glu Thr His Trp Phe Arg Leu Ser Phe His Lys Thr Pro Asp

625 630 635 640

Gly Glu Ile Asn Phe Pro Tyr Pro Lys Asp Arg Thr Thr Leu Phe Asn

645 650 655

His Ala Glu Asp Ala Ala Ile Leu Ala Ala Val Pro Pro His Thr Trp

660 665 670

Arg Ala Thr Thr Arg Val His Thr Ala Lys Arg Pro Leu Leu Asp Gly

675 680 685

Asn Glu Gly Asp Lys Ser Gly Leu Val Val Pro Glu Leu Ala Pro Asp

690 695 700

Trp Ala Ala Phe Leu Glu Thr Arg Ser Arg Pro Ile Val Tyr Ile Leu

705 710 715 720

Gly Arg Ser Arg Val Ser Trp Arg Asn Lys Phe Ala Asp Leu Thr Phe

725 730 735

Trp Arg Glu Pro Leu Leu Asp Thr Pro Arg Ile Lys Arg Thr Lys Leu

740 745 750

Leu Arg Asp Ile Gln Arg Lys Asp Phe Lys Asn Ile Phe Ser Pro Phe

755 760 765

Val Arg Ser Thr Val Glu Glu Ile Ala Glu Ser Val Gly Leu Gly Glu

770 775 780

Lys Gly Thr Leu Leu Gln Ala Leu Ala Arg Lys Leu Ala Gly Ala Gly

785 790 795 800

Ala Lys Gly Lys Glu Val Glu Gln Arg Leu Pro Ala Ala Ala Glu Glu

805 810 815

Leu Glu Arg Arg Tyr Pro Gly Leu Arg Arg Leu Gln Val Phe Ser Gln
820 825 830
Lys Gly Gly Thr Leu Ala Leu Val Asn Pro Ala Asp Gly Pro Pro Arg
835 840 845

Lys Val Gln Ile Lys Pro Ala Ser Glu Gly Val Val Val Trp Gln Ile
850 855 860
Glu Glu Gly Lys Lys Arg Lys Ala Leu Lys Thr His Ile Ser Val Ile
865 870 875 880
Arg Pro Met Pro Leu Leu Lys Phe Gly Phe Pro Arg Ile Asp Glu Pro
885 890 895
Leu Pro Glu Gly Ala Lys Glu Ile Gly Arg Leu Leu Arg His Gln Ile
900 905 910

Ile Trp Leu Asp Ala Glu Pro Asp Arg Pro Ala Gly Phe Tyr Arg Val
915 920 925
Thr Lys Cys Gln Gln Ala Gly Val Thr Val Val Pro Glu Glu Leu Val
930 935 940
Pro Ala Glu Ile Ala Arg Arg Met Gln Val Ala Ser Ala Gln Ala Thr
945 950 955 960
Ala Ala Ser Glu Glu Glu Glu Ala Gly Lys Phe Val Leu Gly Lys Gln
965 970 975

Glu Leu Ala Glu Tyr Phe Ala Arg Glu Gly Arg Glu
980 985

<210> 464
<211> 968
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG33 effectors
<220><223> Description: MG33-3 effector
<400> 464
Met Ala Asp Gln Ile Asn Asn Ser Lys Tyr Ser Pro Lys Leu Ala Glu

1 5 10 15

Arg Ile Arg Glu Phe Asn Ser Ala Phe Lys Leu Gly Val Asp Leu Gly

20 25 30

Thr Lys Glu Gly Gly Ile Ala Leu Val Lys Asp Asn Gln Val Leu Phe

35 40 45

Ala Lys Thr Phe Leu Asp Phe His Lys Glu Asn Leu Lys Asp Arg Arg

50 55 60

Thr His Arg Arg Asn Arg Arg Ser Arg Leu Ala Lys Lys Arg Arg Val

65 70 75 80

Ala Ile Leu Arg Ser Trp Leu Leu Arg Gln Lys Val Asn Gly Lys Gln

85 90 95

Leu Pro Asp Pro Tyr Lys Ile Lys Asp Thr Pro Leu Phe Lys Arg Thr

100 105 110

Asn Ala Lys Asn Trp Ile Asp Ala Val Val Ser Lys Gln Asp Thr Ser

115 120 125

Pro Glu Ala Phe Val Arg Ala Leu Thr Thr Val Phe Arg Lys Arg Gly

130 135 140

Gln Ser Tyr Glu Glu Thr Ala Lys Gln Ile Glu Asp Met Asp Tyr Arg

145 150 155 160

Glu Leu Lys Asp Tyr Ile Asn Ser Leu Gly Ser Ile Thr Glu Glu Glu

165 170 175

Phe Asn Ala Leu Ser Glu Glu Ile Lys Tyr Arg Ser Glu Ser Ser Glu

180 185 190

Thr Ser Ser Glu Lys Asn Arg Tyr Ala Gly Leu Val Asp Ile Leu Lys

195 200 205

Thr Lys Leu Ser Asn Lys Glu Asn Ile Lys Asn Arg Arg Glu Arg Glu

210 215 220

Lys Glu Leu Glu Gln Ile Val Lys Ala Phe Cys Glu Ala Asn Asn Leu

225 230 235 240

His Glu Ser Asp Lys Trp Ile Ser Gln Leu Lys Ser Leu Leu Asn Lys

245 250 255

Pro Ile Arg Lys Ala Arg Phe Ala Asn Arg Ile Val Ile Arg Cys Asn
260 265 270
Ile Cys Asp Arg Pro Thr Pro Lys Lys Ser Arg Pro Asp Ile Arg Glu
275 280 285

Leu Leu Tyr Met Asp Val Ile Arg Asn Phe Leu Arg Ala Gly Arg Ile
290 295 300
Glu Pro Asn Glu Glu Ala Ile Asn Tyr Tyr Lys Thr Leu Tyr Lys Lys
305 310 315 320
Ala Ala Glu Ile Arg Lys Ser Ile Ile Lys Lys Ala Pro Leu Thr Glu
325 330 335
Glu Gln Lys Lys Leu Lys Lys Glu Leu Ser Lys Gln Leu Lys Lys Tyr
340 345 350

Ile Asn Lys Asp Tyr Gly Ala Ser Ala Gln Lys Lys Met Leu Glu Gln
355 360 365
Ile Lys Val Leu Met Phe Glu Lys Leu Ser Gly Arg Ser Arg Tyr Cys
370 375 380
Ile Glu His Leu Lys Ala Arg Ala Asn Gly Glu Asp Val Glu Ala Gly
385 390 395 400
Tyr His Gly His Val Gln Lys Arg His Asp Met Asn Ile Ala Gln Lys
405 410 415

Asn His Asp Lys Arg Val Ile Asn Leu Ile Glu Tyr Met Leu Phe Arg
420 425 430
Ser Asp Glu Ser Leu Ala Met Glu Leu Lys Asn Lys Gly Ile Met Tyr
435 440 445
Ile Thr Ile Glu Ala Pro Glu Pro Asp Thr Lys Lys Ala Lys Lys Gly
450 455 460
Glu Thr Thr Lys Lys Asp Glu Arg Asn Ile Lys Glu Lys Leu Leu Asp
465 470 475 480

Glu Gln Phe Asp Val Glu Gly Gln Arg Phe Val Cys Ile Tyr Thr Gly
485 490 495
Gln Glu Leu Ser Lys Asp Arg Leu Asn Glu Tyr Glu Lys Asp His Ile

500 505 510

Phe Pro Glu Ser Arg Asp Gly Pro Ser Ile Arg Asp Asn Leu Val Ile

515 520 525

Thr Thr Lys Glu Ile Asn Lys Glu Lys Gly Asp Arg Thr Pro Trp Glu

530 535 540

Trp Leu His Asp Asp Pro Val Lys Trp Gln Glu Phe Lys Asn Arg Val

545 550 555 560

Met Arg Leu Tyr Ser Ser Gly Lys Ile Thr Glu Arg Lys Lys Gly Ile

565 570 575

Leu Leu Asn Glu Gly Ser Glu Phe Pro Met Asp Asn Pro Thr Glu Leu

580 585 590

Ala Arg Ala Gly Ala Arg Val Asn Asn Phe Ile Ala Asp Leu Asn Glu

595 600 605

Met Leu Lys Lys His Gly Leu Pro Glu Ala Gln Thr Leu Phe Glu Lys

610 615 620

Gly Lys Pro Ile Val Gln Ile Val Arg Gly Ser Glu Thr Gln Arg Leu

625 630 635 640

Arg Arg Gln Trp Asn Ala Ile Asp Pro Ser Phe Ile Pro Leu Lys Asp

645 650 655

Arg Ala Val Ser Phe Asn His Ala Glu Asp Ala Val Ile Ala Ala Ser

660 665 670

Met Pro Pro Thr Phe Trp Arg Ser Gln Ile Tyr Arg Tyr Thr Trp His

675 680 685

Phe Ala Pro Gly Lys Glu Arg Ser Asp Phe Ala Leu Pro Asp Ile Ala

690 695 700

Pro His Trp Asn Asp Phe Ile Ala Lys Arg Asn Ser Pro Ile Ile Ala

705 710 715 720

Val Leu Gly Lys Thr Lys Tyr Ser Trp Lys Asn Ser Gly Ser Ile Phe

725 730 735

Asp Asp Thr Leu Tyr Lys Lys Tyr Asn Ser Arg Ala Phe Phe Lys Glu

740 745 750

Ile Tyr Lys Gln Pro Gly Ser Lys Glu Asn Asp Asp Asp Lys Ile Asn
755 760 765

Gln Pro Thr Lys Pro Ile Pro Ile Asp Glu His Lys Met Asp Pro Asn
770 775 780

Tyr Lys Tyr Tyr His Val Lys Val Gly Asn Lys Arg Phe Leu Ile Lys
785 790 795 800

Ser Gln Lys Gly Gly Ser Leu Ile Thr Ile Lys Pro Lys His Thr Leu
805 810 815

Trp Pro Arg Thr Ile Gln Val Asn Pro Thr Tyr Gly Ser Val Val Leu
820 825 830

Thr Lys Gly Asp Lys Gly Glu Ile Glu Leu His Tyr Thr Pro Ile Ser
835 840 845

Pro Ile Met Ser Met Tyr Lys Gln Gly Ile Ile Leu Asp Met Asp Glu
850 855 860

Arg Leu Lys Arg Ala Leu Ser Asp Lys Met Arg Tyr Glu Gly Pro Lys
865 870 875 880

Lys Glu Leu Arg Val His Asp Ile Ile Tyr Leu Pro Ala Thr Lys Arg
885 890 895

His Gly Glu Gly Tyr Phe Leu Val Thr Lys Leu Gly Arg Ser Gly Val
900 905 910

Lys Val Val Pro Glu Asp Lys Leu Lys Ile Arg Tyr Thr Lys Gln Asn
915 920 925

Ser Lys Asp Leu Gly Ser Glu Ser Gly Lys Asp Lys Ala Lys Asp Lys
930 935 940

Ser Val Glu Ile Gly Leu Asn Glu Glu Asp Leu Leu Tyr Leu Tyr Asn
945 950 955 960

Asn Pro Asp Ser Ile Arg Ile Lys
965

<210> 465

<211> 358

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG33 effectors
<220><223> Description: MG33-4 effector

<400> 465

Arg Ser Trp Val Leu Arg Gln Ser Leu Pro Asp Gly Ser Arg Leu Pro
1 5 10 15
Asp Pro Tyr Arg Val Met Arg Asp Pro Arg Phe His Val Gln Pro Gly
20 25 30
Met Phe Gln Ser Pro Gly Arg Asp Pro Ala Gln Ala Thr Ser Trp Ile
35 40 45
Asp Leu Ala Arg Gln Gly Lys Thr Asp Ala Glu Gly Phe Val Lys Ala
50 55 60

Leu Thr Leu Ile Phe Gln Lys Arg Gly Tyr Lys Trp Asp Ala Ile Ala
65 70 75 80
Pro Glu Glu Met Thr Asp Asp Lys Leu Lys Asp Phe Leu Ala Thr Ala
85 90 95
Arg Ile Pro Asn Asp Glu Leu Ala Arg Asp Ile Glu Lys Gln Ile Lys
100 105 110
Arg Arg Glu Glu Asn Pro Asp Asp Pro Leu Arg Gly Lys Lys Lys Val
115 120 125

Ser Pro Gly Glu Leu Arg Gly Leu Leu Glu Ala Ala Arg Lys Arg Asp
130 135 140
Arg Gln Pro Arg Gln Ala Glu His Arg Ser Val Lys Glu Ala Asp Leu
145 150 155 160
Arg Glu Val Ile Asp Gly Phe Gly Lys Ala Ala Gly Leu Pro Lys Glu
165 170 175
Leu Thr Glu Arg Trp Lys Gln Glu Leu Cys Gly Gly Ala Asn Glu Lys
180 185 190

Gly Lys Leu Lys His Gly Leu Leu Ser Lys Phe Leu Arg Leu Ala Arg
195 200 205

Phe Lys Asn Arg Leu Arg Ser Gly Cys Ala Trp Cys Gly Lys Ala Thr
210 215 220
Pro Arg Lys Ser Lys Val Arg His Val Ala Tyr Val Ala Ala Val Cys
225 230 235 240
Asn Leu Arg Val Arg Asp Gly Arg Ile Pro Pro Arg Leu Asn Asp Ala
245 250 255

Glu Lys His Val Phe Trp Asn Trp Trp Glu Leu Arg Glu Ala Ala Ala
260 265 270
Gly Lys Ser Glu Thr Glu Lys Asp Ala Pro Lys Glu Ala Gly Ile Lys
275 280 285
Ser His Leu Arg Arg Leu Gly Ala Gln Glu Lys Met Ala Arg Gln Phe
290 295 300
Phe Asp Leu Leu Trp Asn Arg Asp Ala Lys Gly Arg Ala Ser Leu Cys
305 310 315 320

Arg Glu His Leu Glu Gln Ala Ala Lys Gly Ala Ser Met Lys Asp Ala
325 330 335
Gly Val Asp Trp Gln Thr Ile Ser Val Arg Lys Ala Pro Asn Pro Cys
340 345 350
Arg Glu Gln His Asp Ala
355

<210> 466
<211> 439
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG33 effectors
<220><223> Description: MG33-5 effector

<400> 466
Met Leu Asn Pro Lys Leu Glu Glu Arg Ile Lys Gly Phe Leu Pro Gly
1 5 10 15
Leu Arg Val Gly Val Asp Phe Gly Glu Gly Ala Gly Gly Ile Ala Val

20 25 30

Val Lys Gly Asn Lys Ile Leu His Ala Glu Thr Tyr Val Asp Phe His

35 40 45

Glu Thr Thr Leu Glu Gln Arg Arg Gln Leu Arg Arg Gly Arg Arg Thr

50 55 60

Arg His Ala Lys Lys Met Arg Leu Ala Arg Leu Arg Ser Trp Val Leu

65 70 75 80

Arg Gln Ser Leu Pro Asp Gly Ser Arg Leu Pro Asp Pro Tyr Arg Val

85 90 95

Met Arg Asp Pro Arg Phe His Val Gln Pro Gly Met Phe Gln Ser Pro

100 105 110

Gly Arg Asp Pro Ala Gln Ala Thr Ser Trp Ile Asp Leu Ala Arg Gln

115 120 125

Gly Lys Thr Asp Ala Glu Gly Phe Val Lys Ala Leu Thr Leu Ile Phe

130 135 140

Gln Lys Arg Gly Tyr Lys Trp Asp Ala Ile Ala Pro Glu Glu Met Thr

145 150 155 160

Asp Asp Lys Leu Lys Asp Phe Leu Ala Thr Gly Arg Ile Pro Asn Asp

165 170 175

Glu Leu Ala Arg Asp Ile Glu Lys Gln Ile Lys Arg Arg Glu Glu Asn

180 185 190

Pro Asp Asp Pro Leu Arg Gly Lys Lys Lys Val Ser Pro Gly Glu Leu

195 200 205

Arg Gly Leu Leu Glu Ala Ala Arg Lys Arg Asp Arg Gln Pro Arg Gln

210 215 220

Ala Glu His Arg Ser Val Lys Glu Ala Asp Leu Arg Glu Val Ile Asp

225 230 235 240

Gly Phe Gly Lys Ala Ala Gly Leu Pro Lys Glu Leu Thr Glu Arg Trp

245 250 255

Lys Gln Glu Leu Cys Gly Gly Ala Asn Glu Lys Gly Lys Leu Lys His

260 265 270

Gly Leu Leu Ser Lys Phe Leu Arg Leu Ala Arg Phe Lys Asn Arg Leu
275 280 285
Arg Ser Gly Cys Ala Trp Cys Arg Lys Ala Thr Pro Arg Lys Ser Lys
290 295 300
Val Arg His Val Ala Tyr Val Ala Ala Val Cys Asn Leu Arg Val Arg
305 310 315 320

Asp Gly Arg Ile Pro Pro Arg Leu Asn Asp Ala Glu Lys His Val Phe
325 330 335
Trp Asn Trp Trp Glu Leu Arg Glu Ala Ala Ala Gly Lys Ser Glu Thr
340 345 350
Glu Lys Asp Ala Pro Lys Glu Ala Gly Ile Lys Ser His Leu Arg Arg
355 360 365
Leu Gly Ala Gln Glu Lys Met Ala Arg Gln Phe Phe Asp Leu Leu Trp
370 375 380

Asn Arg Asp Ala Lys Gly Arg Ala Ser Leu Cys Arg Glu His Leu Glu
385 390 395 400
Gln Ala Ala Lys Gly Ala Ser Met Lys Asp Ala Gly Val Asp Trp Gln
405 410 415
Thr Ile Ser Val Arg Lys Ala Pro Asn Pro Cys Arg Glu Gln His Asp
420 425 430
Ala Arg Val Leu His Arg Leu
435

<210> 467
<211> 536
<212> PRT
<213> Unknown
<220
><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG33 effectors
<220><223> Description: MG33-6 effector
<400> 467
Gln Asp Asp Pro Glu Asn Pro Ile Arg Gly Lys Ser Lys Val Pro Pro

1 5 10 15

Glu Glu Phe Leu Gly Leu Leu Gln Val Ala Arg Asp Arg Gln Arg Gln

20 25 30

Thr Arg Gln Ala Glu His Arg Ser Val Lys Glu Ala Asp Leu Arg Glu

35 40 45

Val Ile Asp Gly Phe Gly Lys Ala Ala Arg Leu Pro Ala Glu Leu Ile

50 55 60

Gly Arg Trp Glu Leu Glu Leu Cys Gly Gly Thr Ser Pro Lys Ala Lys

65 70 75 80

Glu Lys His Gly Leu Leu Asn Lys Val Leu Arg Pro Ala Arg Phe Glu

85 90 95

Asn Arg Leu Arg Thr Gly Cys Ala Trp Cys Gly Lys Pro Thr Pro Arg

100 105 110

Lys Ser Lys Val Arg His Val Ala Tyr Ala Ala Ala Val Cys Asn Leu

115 120 125

Arg Val Arg Asp Gly Arg Val Pro Arg Arg Leu Asn Asp Gly Glu Met

130 135 140

Gln Val Phe Trp His Trp Trp Glu Leu Gln Glu Ala Val Ala Pro Thr

145 150 155 160

Leu Arg Ser Ala Gly Val Pro Glu Asn Lys Asn Ala Asp Leu Lys Val

165 170 175

Gly Ala Thr Gly Glu Gly Lys Lys Asp Ala Pro Lys Glu Ala Gly Ile

180 185 190

Lys Gly His Leu Arg Arg Ile Gly Ala Gln Val Lys Met Ala Arg Gln

195 200 205

Phe Tyr Asp Leu Leu Trp Asn Pro Asn Ala Lys Gly Arg Ala Ser Leu

210 215 220

Cys Arg Glu His Leu Glu Lys Ala Ala Gln Gly Met Thr Met Lys Asp

225 230 235 240

Ala Gly Val Glu Trp Gln Thr Ile Ser Val Arg Lys Ala Pro Asn Pro

245 250 255

Cys Arg Glu Gln His Asp Ala Arg Val Leu His Arg Leu Glu Gln Ile
260 265 270
Leu Phe Arg Arg Gly Lys Thr Gly Ala Asp Ala Trp Arg Tyr Gly Pro
275 280 285
Val Ala Phe Ile Thr Leu Glu Val Pro Ala Pro Ala Thr Glu Gln Ala
290 295 300

Arg Lys Gly Glu Gln Lys Glu Arg Lys Pro Glu Pro Phe Met Glu Arg
305 310 315 320
Leu Ala Lys Asp Thr Gly Gly Val Cys Ile Tyr Cys Asp Pro Ala Asn
325 330 335
Pro Gln Pro Ala Glu Asp Lys Asp His Ile Phe Pro Gln Ser Arg Gly
340 345 350
Gly Pro Asp Val Trp Asp Asn Leu Val Pro Ser Cys Lys Ala His Asn
355 360 365

Lys Gln Lys Gly Asp Gln Thr Pro Trp Glu Trp Leu Gly Arg Thr Ala
370 375 380
Arg Trp Pro Ala Phe Glu Ala Arg Val Glu Glu Leu Ala Ser Lys Gly
385 390 395 400
Ser Pro Val His Asp Glu Gly Ala Ser Lys Glu Lys Ser Lys Ala Thr
405 410 415
Arg Phe Ile Arg Ile Ser Glu Arg Lys Arg Asp Leu Leu Leu Arg Arg
420 425 430

Glu Pro Asp Tyr Pro Glu Asn Pro Thr Ala Leu Ala His Val Gly Ala
435 440 445
Arg Pro Arg Gln Phe Val Val Gly Leu Ala Glu Leu Phe Thr Arg Arg
450 455 460
Gly Leu Lys Ala Pro Arg Ile Asp Tyr Gln Leu Gly Glu Pro His Val
465 470 475 480
Gln Arg Ile Asp Gly Arg Thr Thr Ser Gln Leu Arg Lys Ser Trp Leu
485 490 495

Lys Gln Pro Asp Glu Arg Thr Asp Asn Phe Pro Pro Lys Asp Arg Trp

500 505 510

Asp Leu Leu Asn His Ala Gln Asp Ala Ala Leu Ile Ala Ala Cys Pro

515 520 525

Pro His Thr Trp Arg Asp Thr Ile

530 535

<210> 468

<211> 428

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG33 effectors

<220><223> Description: MG33-7 effector

<400> 468

Leu Arg Glu Val Ile Asp Gly Phe Gly Lys Ala Ala Gly Leu Pro Lys

1 5 10 15

Glu Leu Thr Glu Arg Trp Lys Gln Glu Leu Cys Gly Gly Ala Asn Glu

20 25 30

Lys Gly Lys Leu Lys His Gly Leu Leu Ser Lys Phe Leu Arg Leu Ala

35 40 45

Arg Phe Lys Asn Arg Leu Arg Ser Gly Cys Ala Trp Cys Gly Lys Ala

50 55 60

Thr Pro Arg Lys Ser Lys Val Arg His Val Ala Tyr Val Ala Ala Val

65 70 75 80

Cys Asn Leu Arg Val Arg Asp Gly Arg Ile Pro Pro Arg Leu Asn Asp

85 90 95

Ala Glu Lys His Val Phe Trp Asn Trp Trp Glu Leu Arg Glu Ala Ala

100 105 110

Ala Gly Lys Ser Glu Thr Glu Lys Asp Ala Pro Lys Glu Ala Gly Ile

115 120 125

Lys Ser His Leu Arg Arg Leu Gly Ala Gln Glu Lys Met Ala Arg Gln

130 135 140

Phe Phe Asp Leu Leu Trp Asn Arg Asp Ala Lys Gly Arg Ala Ser Leu
145 150 155 160
Cys Arg Glu His Leu Glu Gln Ala Ala Lys Gly Ala Ser Met Lys Asp
165 170 175
Ala Gly Val Asp Trp Gln Thr Ile Ser Val Arg Lys Ala Pro Asn Pro
180 185 190

Cys Arg Glu Gln His Asp Ala Arg Val Leu His Arg Leu Glu Gln Ile
195 200 205
Leu Phe Lys Lys Gly Lys Thr Gly Asp Asn Ala Leu Arg Tyr Gly Pro
210 215 220
Val Ala Phe Val Thr Leu Glu Ile Pro Pro Pro Gln Thr Glu Gln Ala
225 230 235 240
Arg Lys Gly Glu Gln Lys Glu Arg Lys Pro Glu Pro Phe Met Glu Arg
245 250 255

Leu Ala Lys Glu Thr Gly Gly Val Cys Ile Tyr Cys Asp Pro Gly Asn
260 265 270
Pro Asn Pro Pro Glu Ser Lys Asp His Ile Phe Pro Asp Ser Arg Gly
275 280 285
Gly Pro Ser Val Trp Asp Asn Leu Val Pro Ala Cys Lys Ala Cys Asn
290 295 300
Thr Ala Lys Leu Asp Gln Thr Pro Trp Glu Trp Phe Gly Arg Asn Asp
305 310 315 320

Thr Ala Arg Trp Ala Ala Phe Glu Ala Arg Val Glu Glu Leu Ala Arg
325 330 335
Lys Gly Val Pro Ala Val Asp Glu Glu Ser Gly Asp Gly Lys Ser Arg
340 345 350
Asn Pro Arg Phe Ile Arg Ile Ser Glu Arg Lys Arg Ser Leu Leu Leu
355 360 365
Arg Arg Glu Ala Asp Tyr Pro Glu Asn Pro Thr Gly Leu Ala His Val
370 375 380

Gly Ser Gly Pro Arg Gln Phe Val Val Gly Leu Ser Asn Leu Phe Val

385 390 395 400

Arg Arg Gly Phe Lys Pro Pro Arg Ile Asp Tyr Gln Leu Gly Gly Ser

405 410 415

His Ala Ser Ser Tyr Gln Arg Gly Cys Arg Ala Cys

420 425

<210> 469

<211> 410

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG33 effectors

<220><223> Description: MG33-8 effector

<400> 469

Thr Glu Arg Trp Lys Gln Glu Leu Cys Gly Gly Ala Asn Glu Lys Gly

1 5 10 15

Lys Leu Lys His Gly Leu Leu Ser Lys Phe Leu Arg Leu Ala Arg Phe

20 25 30

Lys Asn Arg Leu Arg Pro Gly Cys Ala Trp Cys Gly Lys Ala Thr Pro

35 40 45

Arg Lys Ser Lys Val Arg His Val Ala Tyr Val Ala Ala Val Cys Asn

50 55 60

Leu Arg Val Arg Asp Gly Arg Ile Pro Pro Arg Leu Asn Asp Ala Glu

65 70 75 80

Lys His Val Phe Trp Asn Trp Trp Glu Leu Arg Glu Ala Ala Ala Gly

85 90 95

Lys Ser Glu Thr Glu Lys Asp Ala Pro Lys Glu Ala Gly Ile Lys Ser

100 105 110

His Leu Arg Arg Leu Gly Ala Gln Glu Lys Met Ala Arg Gln Phe Phe

115 120 125

Asp Leu Leu Trp Asn Arg Asp Ala Lys Gly Arg Ala Ser Leu Cys Arg

130 135 140

Glu His Leu Glu Gln Ala Ala Lys Gly Ala Ser Met Lys Asp Ala Gly
145 150 155 160
Val Asp Trp Gln Thr Ile Ser Val Arg Lys Ala Pro Asn Pro Cys Arg
165 170 175
Glu Gln His Asp Ala Arg Val Leu His Arg Leu Glu Gln Ile Leu Phe

180 185 190
Lys Lys Gly Lys Thr Gly Asp Asn Ala Leu Arg Tyr Gly Pro Val Ala
195 200 205
Phe Val Thr Leu Glu Ile Pro Pro Pro Gln Thr Glu Gln Ala Arg Lys
210 215 220
Gly Glu Gln Lys Glu Arg Lys Pro Glu Pro Phe Met Glu Arg Leu Ala
225 230 235 240
Lys Glu Thr Gly Gly Val Cys Ile Tyr Cys Asp Pro Gly Asn Pro Asn

245 250 255
Pro Pro Glu Ser Lys Asp His Ile Phe Pro Asp Ser Arg Gly Gly Pro
260 265 270
Ser Val Trp Asp Asn Leu Val Pro Ala Cys Lys Ala Cys Asn Thr Ala
275 280 285
Lys Leu Asp Gln Thr Pro Trp Glu Trp Phe Gly Arg Asn Asp Thr Ala
290 295 300
Arg Trp Ala Ala Phe Glu Ala Arg Val Glu Glu Leu Ala Arg Lys Gly

305 310 315 320
Val Pro Ala Val Asp Glu Glu Ser Gly Asp Gly Lys Ser Arg Asn Pro
325 330 335
Arg Phe Ile Arg Ile Ser Glu Arg Lys Arg Ser Leu Leu Leu Arg Arg
340 345 350
Glu Ala Asp Tyr Pro Glu Asn Pro Thr Gly Leu Ala His Val Gly Ser
355 360 365
Gly Pro Arg Gln Phe Val Val Gly Leu Ser Asn Leu Phe Val Arg Arg

370 375 380
Gly Phe Lys Pro Pro Arg Ile Asp Tyr Gln Leu Gly Gly Ser His Ala

385 390 395 400

Ser Ser Tyr Gln Arg Gly Cys Arg Ala Cys

405 410

<210> 470

<211> 1024

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG33 effectors

<220><223> Description: MG33-9 effector

<400> 470

His Ala Glu Thr Tyr Thr Asp Tyr His Ala Thr Thr Leu Glu Glu Arg

1 5 10 15

Arg Lys Met Arg Arg Gly Arg Arg Thr Arg His Ala Lys Lys Leu Arg

20 25 30

Leu Ala Arg Leu Arg Ser Trp Leu Leu Arg Gln Thr Leu Pro Asp Pro

35 40 45

Tyr Asp Leu Met Arg Arg Lys Asp Phe Gln His Pro Pro Leu Gln Leu

50 55 60

Pro Gln His Leu Pro Val His Arg Gln Glu Ser Arg Thr Thr Ser Pro

65 70 75 80

Trp Cys His Ala Val Ile Lys Gly His Leu Asn Asp Pro Ser Ala Phe

85 90 95

Val Leu Ala Leu Thr His Ile Phe Gln Lys Arg Gly Tyr Lys Tyr Asp

100 105 110

Ala Arg Asp Leu Ser Ser Leu Ser Pro Ser Glu Leu Glu Glu Phe Leu

115 120 125

Asn Ser Cys Cys Leu Leu Glu Gln Ala Gly Ser Leu Lys Asp Ser Leu

130 135 140

Lys Gly Leu Val Glu Arg Val Glu Ser Asn Lys Leu Arg Asn Ala Tyr

145 150 155 160

Glu Lys Ala Leu Thr Arg Glu Pro Glu Pro Arg Lys Ala Leu Pro Arg

165 170 175

Gln Leu Lys Glu Asp Glu Leu Lys Gln Leu Val Lys Ala Phe Gly Ser

180 185 190

Ala Gln Gly Leu Ser Pro Lys Gln Ile Val Thr Trp Glu Lys Gln Leu

195 200 205

Val Gly Leu Leu Asn Lys Thr Ile Arg Glu Pro Arg Phe Glu Asn Arg

210 215 220

Val Ile Ala Gly Cys Ser Trp Cys Gly Lys Asn Thr Pro Arg Lys Ser

225 230 235 240

Arg Lys Gly Val Arg Glu Leu Glu Phe Lys Ala Ala Val Arg Asn Ile

245 250 255

Arg Lys Asp Arg Val Leu Pro Leu Asp Glu Gln Glu Ala Leu Ser Phe

260 265 270

Leu His Leu Trp Asn Asp Asn Ala Phe Arg Asn Lys Gly Leu Lys Ala

275 280 285

Arg Lys Gln Gln Phe Asp Lys Leu Leu Asn Ser Leu Arg Ala Gln Met

290 295 300

Asp Met Ala Ser Gln Leu Ala Glu Leu Cys Gly Asn Asp Lys Gly Arg

305 310 315 320

Gly Arg Ala Asn Leu Cys Val Asp His Leu Ser Leu Ala Ala Asp Gly

325 330 335

Ala Phe Lys Cys Asn Arg His Pro Gly Trp Leu Cys Lys Leu Gly Gly

340 345 350

Ala His Glu Gly His Thr Gln Val Glu Phe Val Gly Gly Thr Gly Leu

355 360 365

Thr Glu Arg Leu Ala Arg Asn Pro Cys Arg Glu Thr His Glu Glu Arg

370 375 380

Val Leu Arg Arg Leu Glu Glu Val Leu Phe Asp Lys Ser Gly Asn Pro

385 390 395 400

Arg Trp Gly Ile Pro Ser Leu Ile Ser Ile Glu Phe Pro Lys Pro Gly

405 410 415

Thr Ala Gln Thr Tyr Asp Cys Pro Ser Cys Lys Glu Lys Leu Ala Ile

420 425 430

Asp Leu Lys Val Asn Arg Lys Ile Arg Lys Leu Ser Leu Gly Asn Ala

435 440 445

Lys Arg Ser Asp Pro Gln Thr Ser Phe Ala Cys Pro Phe Cys Asn Thr

450 455 460

Gly Leu Phe Ile Lys Gly Thr Val Lys Lys Pro Ile Gly Asp Arg Trp

465 470 475 480

Glu Asp Arg Pro Val Tyr Leu Thr His Asp Glu Val Tyr Leu Arg Lys

485 490 495

Ala Lys Gly Gly Met Lys Glu Lys Lys Arg Ala Glu Tyr Leu Arg Glu

500 505 510

Thr Asn Ser Thr Cys Val Tyr Cys Gly Gln Lys Ile Glu Asp Arg Leu

515 520 525

Thr Met Glu Pro Asp His Ile Phe Pro Arg Ala Arg Gly Gly Pro Asp

530 535 540

Val Asp Ser Asn Leu Val Ala Ser Cys His Asp Cys Asn His Pro Asn

545 550 555 560

Thr Gly Lys Gly Asp Arg Thr Pro Tyr Glu Trp Ile Gln Arg Asp Gly

565 570 575

Ala Ser Pro Gly Gly Asn Asp Trp Ser Ala Phe Gln Lys Arg Val Lys

580 585 590

Ser Leu Pro Leu Pro Gln Arg Lys Arg Asp Val Leu Leu Ser Asp Lys

595 600 605

Glu Tyr Tyr Pro Asp Asn Pro Thr Ala Leu Ala Arg Ala Thr Ala Arg

610 615 620

Lys Arg Ala Phe Ile Ala Arg Ile Ala Lys Met Leu Thr Asp His Gly

625 630 635 640

Val Pro Val Asp Gln Ile Ala Leu Asn Tyr Glu Thr Asp Lys Gln Val

645 650 655

Val Ile Gln Ala Val Asp Gly Trp Thr Thr Ser Arg Leu Arg Leu Ser

660 665 670

Trp Arg Phe His Glu Asn Gly Lys Pro Asn Phe Pro Gln Lys Lys Asp

675 680 685

Trp Asp Leu Arg Asn His Ala Gln Asp Ala Ala Leu Ile Ala Ala Ser

690 695 700

Pro Pro His Thr Trp Arg Glu Ala Ile Phe Val Glu Thr Arg Pro Val

705 710 715 720

Asp Asp Pro Asn Lys Pro Ile Pro Gly Leu Ala Pro Arg Ser Leu Ala

725 730 735

Pro Asp Trp Lys Gly Tyr Leu Glu Thr Ile Lys Asp Gln Lys Pro Leu

740 745 750

Val Ser Val Leu Gly Arg Tyr Asp Ala Ser Trp Lys Arg Gly Phe Leu

755 760 765

Asp Ser Thr Phe Trp Ser Phe Arg Ser Arg Asn Gly His Pro Thr Gln

770 775 780

Arg Lys Gln Ile Asp Lys Val Thr Ala Lys Gln Gly Asp Arg Ile Val

785 790 795 800

Asp Pro Lys Ile Lys Asp Ala Phe Arg Thr Leu Cys Glu Ser Tyr Gly

805 810 815

Leu Val Asp Arg Ala Gly Gly Phe Lys Asp Lys Pro Leu Pro Pro Glu

820 825 830

Ala Leu Glu Glu Leu Arg Lys Gln Phe Pro Gly Ile Arg Arg Val Arg

835 840 845

Ile Val Thr Gln Pro Gly Gly Lys Pro Ile Leu Ile Gln Pro Gln Val

850 855 860

Gly Pro Pro Arg Gln Thr Gln Ala Lys Pro Gly Ser Glu Gly Ile Val

865 870 875 880

Leu Trp Leu Arg Leu Asp Thr Thr Lys Lys Arg Pro Arg Glu Gln Thr

885 890 895

Ser Glu Gln Phe Gly Leu Ser Leu Ile Arg Pro Ala Pro Leu Glu Ser

900 905 910

Phe Ser Val Pro Arg Phe Glu Pro Pro Ile Pro Asp Asp Ala Thr Ala

915 920 925

Gln Leu His Leu Tyr Arg His Asp Phe Ile Tyr Leu Gly Glu Asn Gly

930 935 940

Ile His Pro Glu Gly Trp Tyr Arg Leu Lys Glu Phe Ser Asp Asp Ser

945 950 955 960

Val Ile Ala Leu Pro Glu Glu Ala Ile Pro Ala Glu Leu Arg Lys Arg

965 970 975

Met Gly Leu Glu Gln Pro Gly Arg Lys Gly Ser Pro Ser Ala Ala Pro

980 985 990

Ala Ala Pro Gln Glu Arg Arg Leu Gly Lys Glu Glu Leu Lys Gly Leu

995 1000 1005

Leu Arg Ser Phe Arg Gln Arg Lys Leu Arg Ile Val Lys Gly Gly

1010 1015 1020

Gln

<210> 471

<211> 347

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG33 effectors

<220><223> Description: MG33-10 effector

<400> 471

Met Ala Asp Gln Ile Asn Asn Ser Lys Tyr Ser Ser Lys Leu Ala Glu

1 5 10 15

Arg Ile Arg Glu Phe Asn Ser Ala Phe Lys Leu Gly Val Asp Leu Gly

20 25 30

Thr Lys Glu Gly Gly Ile Ala Leu Val Lys Asp Asn Gln Val Leu Phe

35 40 45

Ala Lys Thr Phe Leu Asp Phe His Lys Glu Asn Leu Lys Asp Arg Arg
50 55 60
Thr His Arg Arg Asn Arg Arg Ser Arg Leu Ala Lys Lys Arg Arg Val
65 70 75 80
Ala Ile Leu Arg Ser Trp Leu Leu Arg Gln Lys Val Asn Gly Lys Gln
85 90 95
Leu Pro Asp Pro Tyr Lys Ile Lys Asp Thr Pro Leu Phe Lys Arg Thr
100 105 110

Asn Ala Lys Asn Trp Ile Asp Ala Val Val Ser Lys Gln Asp Thr Ser
115 120 125
Pro Glu Ala Phe Val Arg Ala Leu Thr Thr Val Phe Arg Lys Arg Gly
130 135 140
Gln Ser Tyr Glu Glu Thr Ala Lys Gln Ile Glu Asp Met Asp Tyr Arg
145 150 155 160
Glu Leu Lys Asp Tyr Ile Asn Ser Leu Gly Ser Ile Thr Glu Glu Glu
165 170 175

Phe Asn Ala Leu Ser Glu Glu Ile Lys Tyr Arg Ser Glu Ser Ser Glu
180 185 190
Thr Ser Ser Glu Lys Asn Arg Tyr Ala Gly Leu Val Asp Ile Leu Lys
195 200 205
Thr Lys Leu Ser Asn Lys Glu Asn Ile Lys Asn Arg Arg Lys Arg Glu
210 215 220
Lys Glu Leu Glu Gln Ile Val Lys Ala Phe Cys Glu Ala Asn Asn Val
225 230 235 240

His Glu Ser Asp Lys Trp Ile Ser Gln Leu Lys Ser Leu Leu Asn Lys
245 250 255
Pro Ile Arg Lys Ala Arg Phe Thr Asn Arg Ile Val Ile Arg Cys Asn
260 265 270
Ile Cys Asp Arg Pro Thr Pro Lys Lys Ser Arg Pro Asp Ile Arg Glu
275 280 285
Leu Leu Tyr Met Asp Val Ile Arg Asn Phe Leu Arg Ala Gly Arg Ile

290 295 300

Glu Pro Asn Gly Glu Ala Ile Asn Tyr Tyr Lys Thr Leu Tyr Lys Lys
305 310 315 320
Ala Ala Glu Ile Arg Lys Ser Ile Ile Lys Lys Ala Pro Leu Thr Glu
325 330 335
Glu Gln Lys Lys Leu Lys Lys Glu Leu Ser Lys
340 345

<210> 472
<211> 500
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG33 effectors

<220><223> Description: MG33-11 effector
<400> 472
Lys Asp Glu Arg Asn Ile Lys Glu Lys Leu Leu Asp Glu Gln Phe Asp
1 5 10 15
Val Glu Gly Gln Arg Phe Val Cys Ile Tyr Thr Gly Gln Glu Leu Ser
20 25 30
Lys Asp Arg Leu Asn Glu Tyr Glu Lys Asp His Ile Phe Pro Glu Ser
35 40 45
Arg Asp Gly Pro Ser Ile Arg Asp Asn Leu Val Ile Thr Thr Lys Glu

50 55 60
Ile Asn Lys Glu Lys Gly Asp Arg Thr Pro Trp Glu Trp Leu His Asp
65 70 75 80
Asp Pro Val Lys Trp Gln Glu Phe Lys Asn Arg Val Met Arg Leu Tyr
85 90 95
Ser Ser Gly Lys Ile Thr Glu Arg Lys Lys Glu Leu Leu Leu Asn Glu
100 105 110
Gly Ser Glu Phe Pro Met Asp Asn Pro Thr Glu Leu Ala Arg Ala Gly

115 120 125

Ala Arg Val Asn Asn Phe Ile Ala Asp Leu Asn Glu Met Leu Lys Lys

130 135 140

His Gly Leu Pro Glu Ala Gln Thr Leu Phe Glu Lys Gly Lys Pro Ile

145 150 155 160

Val Gln Ile Val Arg Gly Ser Glu Thr Gln Arg Leu Arg Arg Gln Trp

165 170 175

Asn Ala Ile Asp Pro Ser Phe Ile Pro Leu Lys Asp Arg Ala Val Ser

180 185 190

Phe Asn His Ala Glu Asp Ala Val Ile Ala Ala Ser Met Pro Pro Thr

195 200 205

Phe Trp Arg Ser Gln Ile Tyr Arg Tyr Thr Trp His Phe Ala Pro Ser

210 215 220

Lys Glu Arg Ser Asp Phe Ala Leu Pro Asp Ile Ala Pro His Trp Asn

225 230 235 240

Asp Phe Ile Ala Lys Arg Asn Ser Pro Ile Ile Ala Val Leu Gly Lys

245 250 255

Thr Lys Tyr Gly Trp Lys Asn Ser Gly Ser Ile Phe Asp Asp Thr Leu

260 265 270

Tyr Lys Lys Tyr Asn Ser Arg Ala Phe Phe Lys Glu Ile Tyr Lys Gln

275 280 285

Pro Glu Ser Lys Glu Asn Asp Asp Asp Lys Ile Asn Arg Pro Thr Lys

290 295 300

Pro Ile Pro Ile Asp Glu His Lys Met Asp Pro Asn Tyr Lys Tyr Tyr

305 310 315 320

His Val Lys Val Gly Asn Lys Arg Phe Leu Ile Lys Ser Gln Lys Gly

325 330 335

Gly Ser Leu Ile Thr Ile Lys Pro Lys His Thr Leu Trp Pro Arg Thr

340 345 350

Ile Gln Val Asn Pro Thr Tyr Gly Ser Val Val Leu Thr Lys Gly Asp

355 360 365

Lys Gly Glu Ile Glu Leu His Tyr Thr Pro Ile Ser Pro Ile Met Ser

370 375 380

Met Tyr Lys Gln Gly Ile Ile Leu Asp Met Asp Glu Arg Leu Lys Arg

385 390 395 400

Ala Leu Ser Asp Lys Met Arg Tyr Glu Gly Pro Lys Lys Glu Leu Arg

405 410 415

Val His Asp Ile Ile Tyr Leu Pro Ala Thr Lys Arg His Gly Glu Gly

420 425 430

Tyr Phe Leu Val Thr Lys Leu Gly Arg Ser Gly Val Lys Val Val Pro

435 440 445

Glu Asp Lys Leu Lys Ile Arg Tyr Thr Lys Gln Asn Ser Lys Asp Leu

450 455 460

Gly Ser Glu Ser Gly Lys Asp Lys Ala Lys Asp Lys Ser Val Glu Ile

465 470 475 480

Gly Leu Asn Glu Glu Asp Leu Leu Tyr Leu Tyr Asn Asn Pro Asp Ser

485 490 495

Ile Arg Ile Lys

500

<210> 473

<211> 811

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG33 effectors

<220><223> Description: MG33-12 effector

<400> 473

Met Ala His Ser Thr Ser Glu Glu Arg His Phe Ser Gln Ile Cys Val

1 5 10 15

Ala Gly Ala Lys Leu Leu Thr Pro Arg Leu Arg Glu Arg Val Asp Ser

20 25 30

Phe Leu Pro Thr Ile Arg Val Gly Ile Asp Phe Gly Glu Ser Ala Gly

35 40 45

Gly Ile Ala Val Val Gln Gly Asn Arg Ile Leu His Ala Glu Thr Tyr

50 55 60

Val Asp Phe His Ile Ser Asp Leu Glu Gln Arg Arg Gln Leu Arg Arg

65 70 75 80

Gly Arg Arg Thr Arg Asn Ala Lys Lys Met Arg Leu Ala Arg Leu Arg

85 90 95

Ser Trp Val Leu Arg Gln Lys Leu Pro Asp Gly Ala Arg Leu Pro Asp

100 105 110

Pro Tyr Val Val Met Lys Asp Pro Cys Phe His Val Gln Pro Gly Ile

115 120 125

Phe Arg Ile Pro Gly Lys Asn Pro Ala Asp Val Pro Ser Trp Ile Asp

130 135 140

Leu Ala Lys Gln Gly Lys Val Ala Ala Asn Gly Phe Val Arg Ala Leu

145 150 155 160

Thr Leu Ile Phe Gln Lys Arg Gly Tyr Lys Trp Asp Ala Val Glu Leu

165 170 175

Gln Lys Met Thr Asp Asp Arg Leu Lys Asp Phe Leu Gln Thr Ala Arg

180 185 190

Val Pro Ser Asp Asn Leu Ala Ser Ile Ile Arg Asp Glu Ile Glu Arg

195 200 205

Arg Arg Ala Cys Pro Asp Asp Ser Ala Arg Gly Arg Lys Arg Val Pro

210 215 220

Pro Asp Gln Leu Val Asp Leu Leu Ser Glu Ala Arg Gly Arg Asn Pro

225 230 235 240

Gln Pro Arg Val Ala Glu His Arg Ser Val Lys Glu Ala Asp Leu Gln

245 250 255

Ser Val Ile Glu Gly Phe Gly Asn Phe Thr Asn Ile Ser Lys Asp Ala

260 265 270

Ile Arg Arg Trp Gln Arg Glu Leu Cys Gly Leu Leu Asn Lys Val Leu

275 280 285

Arg Pro Ala Arg Phe Asp Asn Arg Leu Lys Ser Gly Cys Ala Trp Cys

290 295 300

Gly Lys Pro Thr Pro Arg Lys Arg Lys Val Arg Glu Ile Ala Tyr Glu

305 310 315 320

Ala Ala Val Arg Asn Leu Arg Val Arg Glu Gly Arg Leu Val Arg Pro

325 330 335

Leu Lys Pro Glu Glu Phe Ala Glu Phe Arg Arg Trp Trp Asp Leu Arg

340 345 350

Gly Gln Asn Asn Glu Pro Gly Lys Thr Val Pro Lys Leu Lys Ala Ile

355 360 365

Gln Thr His Leu Arg Lys Leu Gly Ser Gln Glu Gln Met Ala Arg Gln

370 375 380

Ile Phe Asp Leu Leu Trp Asn Asp Lys Pro Asp Gly Arg Ala Ser Leu

385 390 395 400

Cys Lys Glu His Leu Thr Lys Ala Ala Gln Gly Arg Thr Met Lys Asp

405 410 415

Val Val Gly Glu Trp His Arg Met Lys Val Arg Lys Ala Pro Asn Pro

420 425 430

Cys Arg Glu Gln His Asp Lys Arg Val Met His Arg Leu Glu Gln Ile

435 440 445

Leu Phe Lys Pro Gly Lys Gln Gly Glu Glu Ala Trp Arg Tyr Gly Pro

450 455 460

Val Gln Phe Ile Thr Leu Glu Val Leu Lys Pro Gln Thr Glu Gln Ala

465 470 475 480

Arg Lys Gly Glu Gln Lys Leu Arg Lys Pro Glu Ser Phe Phe Asp Arg

485 490 495

Leu Lys Gln Glu Thr Asp Gly Thr Cys Phe Tyr Cys Asp Leu Lys Pro

500 505 510

Pro Arg Leu Ala Glu Asp Lys Asp His Ile Phe Pro Gln Ser Arg Gly

515 520 525

Gly Pro Asp Val Trp Asp Asn Leu Ile Pro Val Cys Arg Pro Cys Asn
530 535 540
Ala Ala Lys Gly Asn Gln Thr Pro Phe Glu Trp Leu Gly Gly Ser Ile

545 550 555 560
Glu Gly Trp Asp Arg Phe Thr Gln Arg Val Glu Glu Ile Ala Thr Arg
565 570 575
Gly Val Gln Ile Glu Arg Glu Asp Gly Lys Lys Asp Val Val Arg Ile
580 585 590
Ser Glu Arg Lys Arg Ala Leu Leu Leu Ser Gln Asn Ala Asp Tyr Pro
595 600 605
Glu Asn Leu Thr Ala Leu Ala His Val Gly Gly Arg Pro Arg Gln Phe

610 615 620
Val Val Asp Leu Gly Glu Leu Phe Lys Lys Arg Gly Val Met Ser Pro
625 630 635 640
Thr Val Asn Phe Glu Leu Asp His Pro Phe Val Gln Arg Ile Asp Gly
645 650 655
Arg Thr Thr Thr Gln Leu Arg Lys Ser Trp Leu Ser Lys Thr Asp Gly
660 665 670
Ala Asp Asn Phe Pro Leu Lys Asn Asp Leu Asp Leu Leu Asn His Ala

675 680 685
Gln Asp Ala Ala Leu Ile Ala Ala Cys Pro Pro His Thr Trp Arg Glu
690 695 700
Thr Ile Phe Arg Tyr Arg Ala Ser Arg Pro Arg Trp Asp Gly Lys Val
705 710 715 720
Ile Glu Gln Asp Gly Leu Ala Val Pro Glu Leu Ala Pro Asp Trp Ala
725 730 735
Glu Tyr Met Glu Arg Arg Thr Trp Pro Leu Val Lys Val Leu Gly Arg

740 745 750
Tyr Pro Ile Ser Trp Lys Arg Lys Phe Ala Asp Leu Thr Phe Ser Gln
755 760 765
Asn Pro Asp Asn Leu Asp Glu Lys Arg Leu Val Gln Tyr Leu Pro Leu

770 775 780

Lys Asp Leu Gln Tyr Ser Gly Lys Gly Pro Asp Asp Lys Arg His Pro

785 790 795 800

Ala Glu Thr Glu Ile Ala Asp Pro Thr Leu Asp

805 810

<210> 474

<211> 358

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG33 effectors

<220><223> Description: MG33-13 effector

<400> 474

Lys Val Gly Pro Phe Leu Glu Thr Val Arg Val Gly Val Asp Phe Gly

1 5 10 15

Glu Tyr Ala Gly Gly Ile Ala Ile Leu Gln Gly Asn Glu Val Arg His

20 25 30

Ala Glu Val Phe Leu Asp Phe His Ala Ala Thr Leu Glu Gln Arg Arg

35 40 45

Asp Phe Arg Arg Asn Arg Arg Thr Arg His Ala Lys Lys Met Arg Leu

50 55 60

Ala Arg Leu Arg Ser Trp Val Met Arg Gln Lys Arg Pro Asp Gly Ser

65 70 75 80

Arg Trp Phe Arg Asp Pro Tyr Glu Leu Met Arg Ile Tyr Gly Phe Gln

85 90 95

Cys Gln Pro Gly Glu Tyr Ala Val Gly Lys Gly Asn Leu Ala Ala Val

100 105 110

Lys Gly Asp Leu Pro Thr Trp Ile Glu Ala Val Arg Arg Gly Glu Arg

115 120 125

Thr Asp Pro Asp Ser Phe Val Ile Ala Leu Thr His Leu Phe Arg Lys

130 135 140

Arg Gly Phe Gly Tyr Ser Asp Ala Asp Leu Glu Ala Met Asn Asp Val
145 150 155 160
Gln Leu Arg Asp Phe Leu Ala Ser Ala Cys Leu Lys Asn Ser Pro Gln

165 170 175
Thr Phe Leu Gln Lys Leu Asp Val Gln Val Lys Arg Arg Asp Leu Ile
180 185 190
Glu Glu Asp Ala Asp Gln Ala Trp Arg Gly Lys Thr Lys Val Gln Pro
195 200 205
Lys Glu Leu Arg Glu Leu Phe Asp Gln Ala Lys Lys Glu Leu Pro Lys
210 215 220
Arg Arg Lys Ala Val His Arg Arg Glu Lys Val Asn Ile Leu Gln Asp

225 230 235 240
Met Val Arg Lys Phe Gly Glu Ala Asn Gln Leu Ser Asp Asp Thr Ile
245 250 255
Lys Gln Trp Gln Asp Gln Leu Ala Gly Pro Glu Ser Gln Glu Asp Phe
260 265 270
Asp Pro Arg Lys Lys Pro Glu Gly Leu Leu Asn Lys Val Leu Arg Glu
275 280 285
Pro Arg Phe Glu Asn Arg Val Ser Gly Gly Cys Ala Trp Cys Gly Lys

290 295 300
Thr Cys Ala Arg Lys Thr Lys Ser Arg Lys Glu Ala Tyr Leu Ala Ala
305 310 315 320
Ile Asn Asn Leu Arg Val Trp Glu Ile Pro Pro Val Ser Lys Leu Leu
325 330 335
Gly Pro Leu Gln Lys Asp Arg Leu Arg Ser Ile Trp Gln Gly Gly Asn
340 345 350
Gly Asn Ala Thr Gln Ala
355

<210> 475
<211> 826
<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG33 effectors

<220><223> Description: MG33-14 effector

<400> 475

Arg Gly Gln Ser Tyr Glu Glu Thr Ala Lys Gln Ile Glu Asp Met Asp
1 5 10 15
Tyr Arg Glu Leu Lys Asp Tyr Ile Asn Ser Leu Gly Ser Ile Thr Glu
20 25 30
Glu Glu Phe Asn Ala Leu Ser Glu Glu Ile Lys Tyr Arg Ser Glu Ser

35 40 45
Ser Glu Thr Ser Ser Glu Lys Asn Arg Tyr Ala Gly Leu Val Asp Ile
50 55 60
Leu Lys Thr Lys Leu Ser Asn Lys Glu Asn Ile Lys Asn Arg Arg Glu
65 70 75 80
Arg Glu Lys Glu Leu Glu Gln Ile Val Lys Ala Phe Cys Glu Ala Asn
85 90 95
Asn Leu His Glu Ser Asp Lys Trp Ile Ser Gln Leu Lys Ser Leu Leu

100 105 110
Asn Lys Pro Ile Arg Lys Ala Arg Phe Ala Asn Arg Ile Val Ile Arg
115 120 125
Cys Asn Ile Cys Asp Arg Pro Thr Pro Lys Lys Ser Arg Pro Asp Ile
130 135 140
Arg Glu Leu Leu Tyr Met Asp Val Ile Arg Asn Phe Leu Arg Ala Gly
145 150 155 160
Arg Ile Glu Pro Asn Glu Glu Ala Ile Asn Tyr Tyr Lys Thr Leu Tyr

165 170 175
Lys Lys Ala Ala Glu Ile Arg Lys Ser Ile Ile Lys Lys Ala Pro Leu
180 185 190
Thr Glu Glu Gln Lys Lys Leu Lys Lys Glu Leu Ser Lys Gln Leu Lys
195 200 205

Lys Tyr Ile Asn Lys Asp Tyr Arg Ala Ser Ala Gln Lys Lys Met Leu

210 215 220

Glu Gln Ile Lys Val Leu Met Phe Glu Lys Leu Ser Gly Arg Ser Arg

225 230 235 240

Tyr Cys Ile Glu His Leu Lys Ala Arg Ala Asn Gly Glu Asp Val Glu

245 250 255

Ala Gly Tyr His Gly His Val Gln Lys Arg His Asp Met Asn Ile Ala

260 265 270

Gln Lys Asn His Asp Lys Arg Val Ile Asn Leu Ile Glu Tyr Met Leu

275 280 285

Phe Arg Ser Asp Glu Ser Leu Ala Met Glu Leu Lys Asn Lys Gly Ile

290 295 300

Met Tyr Ile Thr Ile Glu Ala Pro Glu Pro Asp Thr Lys Lys Ala Lys

305 310 315 320

Lys Gly Glu Thr Thr Lys Lys Asp Glu Arg Asn Ile Lys Glu Lys Leu

325 330 335

Leu Asp Glu Gln Phe Asp Ala Asp Gly Gln Arg Phe Val Cys Ile Tyr

340 345 350

Thr Gly Gln Glu Leu Ser Lys Asp Arg Leu Asn Glu Tyr Glu Lys Asp

355 360 365

His Ile Phe Pro Glu Ser Arg Asp Gly Pro Ser Ile Arg Asp Asn Leu

370 375 380

Val Ile Thr Thr Lys Glu Ile Asn Lys Glu Lys Gly Asp Arg Thr Pro

385 390 395 400

Trp Glu Trp Leu His Asp Asp Pro Val Lys Trp Gln Glu Phe Lys Asn

405 410 415

Arg Val Met Arg Leu Tyr Ser Ser Gly Lys Ile Thr Glu Arg Lys Lys

420 425 430

Glu Leu Leu Leu Asn Glu Gly Ser Glu Phe Pro Met Asp Asn Pro Thr

435 440 445

Glu Leu Ala Arg Ala Gly Ala Arg Val Asn Asn Phe Ile Ala Asp Leu

450 455 460

Asn Glu Met Leu Lys Lys His Gly Leu Pro Glu Ala Gln Thr Leu Phe

465 470 475 480

Glu Lys Gly Lys Pro Ile Val Gln Ile Val Arg Gly Ser Glu Thr Gln

485 490 495

Arg Leu Arg Arg Gln Trp Asn Ala Ile Asp Pro Ser Phe Ile Pro Leu

500 505 510

Lys Asp Arg Ala Val Ser Phe Asn His Ala Glu Asp Ala Val Ile Ala

515 520 525

Ala Ser Met Pro Pro Thr Phe Trp Arg Ser Gln Ile Tyr Arg Tyr Thr

530 535 540

Trp His Phe Ala Thr Ser Lys Glu Arg Ser Asp Phe Ala Leu Pro Asp

545 550 555 560

Ile Ala Pro His Trp Asn Asp Phe Ile Ala Lys Arg Asn Ser Pro Ile

565 570 575

Ile Ala Val Leu Gly Lys Thr Lys Tyr Gly Trp Lys Asn Ser Gly Ser

580 585 590

Ile Phe Asp Asp Thr Leu Tyr Lys Lys Tyr Asn Pro Arg Ala Phe Phe

595 600 605

Lys Glu Ile Tyr Lys Gln Pro Gln Leu Lys Glu Asn Asp Asn Asp Lys

610 615 620

Ile Asn Gln Pro Thr Lys Pro Ile Pro Ile Asp Glu His Lys Met Asp

625 630 635 640

Pro Asn Tyr Lys Tyr Tyr His Val Lys Val Gly Asn Lys Arg Phe Leu

645 650 655

Ile Lys Ser Gln Lys Gly Gly Ser Leu Ile Thr Ile Lys Pro Lys His

660 665 670

Thr Leu Trp Pro Arg Thr Ile Gln Val Asn Pro Thr Tyr Gly Ser Val

675 680 685

Val Leu Thr Lys Gly Asp Lys Gly Glu Ile Glu Leu His Tyr Thr Pro

690 695 700

Ile Ser Pro Ile Met Ser Met Tyr Lys Gln Gly Ile Ile Leu Asp Met
705 710 715 720
Asp Glu Arg Leu Lys Arg Ala Leu Ser Asp Lys Met Arg Tyr Glu Gly
725 730 735
Pro Lys Lys Glu Leu Arg Val His Asp Ile Ile Tyr Leu Pro Ala Thr

740 745 750
Lys Arg His Gly Glu Gly Tyr Phe Leu Val Thr Lys Leu Gly Arg Ser
755 760 765
Gly Val Lys Val Val Pro Glu Asp Lys Leu Lys Ile Arg Tyr Thr Lys
770 775 780
Gln Asn Ser Lys Asp Leu Gly Ser Glu Ser Gly Lys Asp Lys Ala Lys
785 790 795 800
Asp Lys Ser Val Glu Ile Gly Leu Asn Glu Glu Asp Leu Leu Tyr Leu

805 810 815
Tyr Asn Asn Pro Asp Ser Ile Arg Ile Lys
820 825

<210> 476
<211> 444
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG33 effectors
<220><223> Description: MG33-15 effector
<400> 476
Tyr Lys Ile Lys Asp Thr Pro Leu Phe Lys Arg Thr Asn Ala Lys Asn
1 5 10 15
Trp Ile Asp Ala Val Val Ser Lys Gln Asp Thr Ser Pro Glu Ala Phe

20 25 30
Val Arg Ala Leu Thr Thr Val Phe Arg Lys Arg Gly Gln Ser Tyr Glu
35 40 45
Glu Met Ala Lys Gln Ile Glu Asp Met Thr Tyr Arg Glu Leu Lys Asp

50 55 60

Tyr Ile Asn Ser Leu Gly Ser Ile Thr Glu Glu Glu Phe Asn Ala Leu

65 70 75 80

Ser Glu Glu Ile Lys Tyr Arg Asn Glu Ser Ser Glu Lys Leu Ser Glu

85 90 95

Lys Asn Arg Tyr Ile Ser Leu Leu Glu Lys Leu Lys Thr Lys Leu Ser

100 105 110

Asn Lys Glu Asn Ile Lys Asn Arg Arg Glu Arg Glu Lys Glu Leu Glu

115 120 125

Gln Ile Val Lys Thr Phe Cys Glu Ala Asn Asn Val His Glu Ser Asp

130 135 140

Lys Trp Val Ser Gln Leu Lys Ser Leu Leu Asn Lys Pro Ile Arg Lys

145 150 155 160

Ala Arg Phe Thr Asn Arg Ile Val Ile Arg Cys Asn Ile Cys Asp Arg

165 170 175

Pro Thr Pro Lys Lys Ser Arg Pro Asp Ile Arg Glu Leu Leu Tyr Met

180 185 190

Asp Ala Ile Arg Asn Phe Leu Arg Ala Gly Arg Ile Glu Pro Asn Glu

195 200 205

Glu Ala Ile Asn Tyr Tyr Lys Thr Leu Tyr Lys Lys Ala Ala Glu Ile

210 215 220

Arg Glu Ser Ile Ile Lys Lys Ala Pro Leu Thr Glu Glu Gln Gly Lys

225 230 235 240

Leu Lys Lys Glu Leu Ser Lys Gln Leu Lys Lys Tyr Ile Asn Lys Asp

245 250 255

Tyr Arg Ala Ser Ala Gln Lys Lys Met Leu Glu Gln Ile Lys Val Leu

260 265 270

Met Phe Glu Arg Leu Ser Gly Arg Ser Arg Tyr Cys Ile Glu His Leu

275 280 285

Lys Ala Arg Ala Asn Gly Glu Asp Val Glu Ala Gly Tyr His Gly His

290 295 300

Ile Gln Lys Arg His Asp Met Asn Ile Ala Gln Lys Asn His Asp Asn
305 310 315 320
Arg Val Ile Asn Leu Ile Glu Tyr Met Leu Phe His Arg Asp Glu Ser
325 330 335
Leu Ala Lys Glu Leu Lys Asp Lys Gly Ile Met Tyr Ile Thr Ile Glu

340 345 350
Ala Pro Glu Pro Asp Thr Lys Lys Ala Lys Lys Gly Glu Ile Thr Lys
355 360 365
Arg Asp Glu Arg Asn Ile Lys Glu Lys Leu Leu Asp Glu Gln Phe Asp
370 375 380
Ala Glu Gly Gln Arg Phe Ile Cys Ile Tyr Thr Gly Gln Glu Leu Ser
385 390 395 400
Lys Asp Arg Leu Asn Glu Tyr Glu Lys Asp His Ile Phe Pro Glu Ser

405 410 415
Arg Asp Gly Pro Ser Ile Arg Asp Asn Leu Val Ile Thr Thr Lys Glu
420 425 430
Ile Asn Lys Glu Lys Gly Asp Arg Thr Pro Trp Glu
435 440

<210> 477
<211> 850
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG33 effectors
<220><223> Description: MG33-16 effector
<400> 477

Glu Gly Gly Ile Ala Leu Val Lys Asp Asn Gln Val Leu Phe Ala Lys
1 5 10 15
Thr Phe Leu Asp Phe His Lys Glu Asn Leu Lys Asp Arg Arg Thr His
20 25 30
Arg Arg Asn Arg Arg Ser Arg Leu Ala Lys Lys Arg Arg Val Ala Ile

35 40 45

Leu Arg Ser Trp Leu Leu Arg Gln Lys Val Asn Gly Lys Gln Leu Pro

50 55 60

Asp Pro Tyr Lys Ile Lys Asp Thr Pro Leu Phe Lys Arg Thr Asn Ala

65 70 75 80

Lys Asn Trp Ile Asp Ala Val Val Ser Lys Gln Asp Thr Ser Pro Glu

85 90 95

Ala Phe Val Arg Ala Leu Thr Thr Val Phe Arg Lys Arg Gly Gln Ser

100 105 110

Tyr Glu Glu Thr Ala Lys Gln Ile Glu Asp Met Asp Tyr Arg Glu Leu

115 120 125

Lys Asp Tyr Ile Asn Ser Leu Gly Ser Ile Thr Glu Glu Glu Phe Asn

130 135 140

Ala Leu Ser Glu Glu Ile Lys Tyr Arg Ser Glu Ser Ser Glu Thr Ser

145 150 155 160

Ser Glu Lys Asn Arg Tyr Ala Gly Leu Val Asp Ile Leu Lys Thr Lys

165 170 175

Leu Ser Asn Lys Glu Asn Ile Lys Asn Arg Arg Glu Arg Glu Lys Glu

180 185 190

Leu Glu Gln Ile Val Lys Ala Phe Cys Glu Ala Asn Asn Val His Glu

195 200 205

Ser Asp Lys Trp Ile Ser Gln Leu Lys Ser Leu Leu Asn Lys Pro Ile

210 215 220

Arg Lys Val Arg Phe Thr Asn Arg Ile Val Ile Arg Cys Asn Ile Cys

225 230 235 240

Asp Arg Pro Thr Pro Lys Lys Ser Arg Pro Asp Ile Arg Glu Leu Leu

245 250 255

Tyr Met Asp Val Ile Arg Asn Phe Phe Arg Ala Gly Arg Ile Glu Pro

260 265 270

Asn Glu Glu Ala Ile Asn Tyr Tyr Lys Thr Leu Tyr Lys Lys Ala Ala

275 280 285

Glu Ile Arg Lys Ser Ile Ile Lys Lys Ala Pro Leu Thr Glu Glu Gln
290 295 300
Lys Lys Leu Lys Lys Glu Leu Ser Lys Gln Leu Lys Lys Tyr Ile Asn
305 310 315 320

Lys Asp Tyr Arg Ala Ser Ala Gln Lys Lys Met Leu Glu Gln Ile Lys
325 330 335
Val Leu Met Phe Glu Lys Leu Ser Gly Arg Ser Arg Tyr Cys Ile Glu
340 345 350
His Leu Lys Ala Arg Ala Asn Gly Glu Asp Val Glu Ala Gly Tyr His
355 360 365
Gly His Val Gln Lys Arg His Asp Met Asn Ile Ala Gln Lys Asn His
370 375 380

Asp Lys Arg Val Ile Asn Leu Ile Glu Tyr Met Leu Phe Arg Ser Asp
385 390 395 400
Glu Ser Leu Ala Met Glu Leu Lys Asn Lys Gly Ile Met Tyr Ile Thr
405 410 415
Ile Glu Ala Pro Glu Pro Asp Thr Lys Lys Leu Lys Lys Gly Lys Pro
420 425 430
Gln Lys Lys Asp Glu Arg Asn Ile Lys Glu Lys Leu Leu Asp Glu Gln
435 440 445

Phe Asp Val Glu Gly Gln Arg Phe Val Cys Ile Tyr Thr Gly Gln Glu
450 455 460
Leu Ser Lys Asp Arg Leu Asn Glu Tyr Glu Lys Asp His Ile Phe Pro
465 470 475 480
Glu Ser Arg Asp Gly Pro Ser Ile Arg Asp Asn Leu Val Ile Thr Thr
485 490 495
Lys Glu Ile Asn Lys Glu Lys Gly Asp Arg Thr Pro Trp Glu Trp Leu
500 505 510

His Asp Asp Pro Val Lys Trp Gln Glu Phe Lys Asn Arg Val Met Arg
515 520 525
Leu Tyr Ser Ser Gly Lys Ile Thr Glu Arg Lys Lys Glu Leu Leu Leu

530 535 540

Asn Glu Gly Ser Glu Phe Pro Met Asp Asn Pro Thr Glu Leu Ala Arg
545 550 555 560

Ala Gly Ala Arg Val Asn Asn Phe Ile Ala Asp Leu Asn Glu Met Leu
565 570 575

Lys Lys His Gly Leu Pro Glu Ala Gln Thr Leu Phe Glu Lys Gly Lys
580 585 590

Pro Ile Val Gln Ile Val Arg Gly Ser Glu Thr Gln Arg Leu Arg Arg
595 600 605

Gln Trp Asn Ala Ile Asp Pro Ser Phe Ile Pro Leu Lys Asp Arg Ala
610 615 620

Val Ser Phe Asn His Ala Glu Asp Ala Val Ile Ala Ala Ser Met Pro
625 630 635 640

Pro Thr Phe Trp Arg Ser Gln Ile Tyr Arg Tyr Thr Trp His Phe Ala
645 650 655

Pro Ser Lys Glu Arg Ser Asp Phe Ala Leu Pro Asp Ile Ala Pro Asn
660 665 670

Trp Asp Asp Phe Ile Ala Lys Arg Asn Ser Pro Ile Ile Ala Val Leu
675 680 685

Gly Lys Thr Lys Tyr Ser Trp Lys Asn Ser Gly Ser Ile Phe Asp Asp
690 695 700

Thr Leu Tyr Lys Lys Tyr Asn Ser Arg Ala Phe Phe Lys Glu Ile Tyr
705 710 715 720

Lys Gln Pro Gly Ser Lys Glu Asn Asp Asp Asp Lys Ile Asn Gln Pro
725 730 735

Thr Lys Pro Ile Pro Ile Asp Glu His Lys Met Asp Pro Asn Tyr Lys
740 745 750

Tyr Tyr His Val Lys Val Gly Asn Lys Arg Leu Leu Ile Lys Ser Gln
755 760 765

Lys Gly Gly Ser Leu Ile Thr Ile Lys Pro Lys His Thr Leu Trp Pro
770 775 780

Arg Thr Ile Gln Val Asn Pro Thr Tyr Gly Ser Val Val Leu Thr Lys
785 790 795 800
Gly Asp Lys Gly Glu Ile Glu Leu His Tyr Thr Pro Ile Ser Pro Ile
805 810 815
Met Ser Met Tyr Lys Gln Gly Ile Ile Leu Asp Met Asp Glu Arg Leu
820 825 830

Lys Arg Ala Leu Ser Asp Lys Met Arg Tyr Glu Gly Pro Lys Lys Glu
835 840 845
Leu Arg
850

<210> 478
<211> 483
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG33 effectors
<220><223> Description: MG33-17 effector
<400> 478
Phe Leu Asp Phe His Lys Glu Asn Leu Lys Asp Arg Arg Thr His Arg
1 5 10 15
Arg Asn Arg Arg Ser Arg Leu Ala Lys Lys Arg Arg Val Ala Ile Leu

20 25 30
Arg Ala Trp Leu Leu Arg Gln Lys Val Asn Gly Lys Gln Leu Pro Asp
35 40 45
Pro Tyr Lys Ile Lys Asp Thr Pro Leu Phe Lys His Thr Asn Ala Lys
50 55 60
Asn Trp Ile Asp Ala Val Val Ser Lys Gln Asp Thr Ser Pro Glu Ala
65 70 75 80
Phe Val Arg Ala Ile Thr Thr Val Phe Arg Lys Arg Gly Gln Ser Tyr

85 90 95
Glu Glu Thr Ala Lys Gln Ile Glu Asp Met Asp Tyr Arg Glu Leu Lys

100 105 110

Asp Tyr Ile Asn Ser Leu Gly Ser Ile Thr Glu Glu Glu Phe Asn Ala

115 120 125

Leu Ser Glu Glu Ile Lys Tyr Arg Ser Glu Ser Ser Glu Thr Ser Ser

130 135 140

Glu Lys Asn Arg Tyr Ala Gly Leu Val Asp Ile Leu Lys Thr Lys Leu

145 150 155 160

Ser Asn Lys Glu Asn Ile Lys Asn Arg Arg Glu Arg Glu Lys Glu Leu

165 170 175

Glu Gln Ile Val Lys Ala Phe Cys Glu Ala Asn Asn Leu His Glu Ser

180 185 190

Asp Lys Trp Ile Ser Gln Leu Lys Ser Leu Leu Asn Lys Pro Ile Arg

195 200 205

Lys Ala Arg Phe Ala Asn Arg Ile Val Ile Arg Cys Asn Ile Cys Asp

210 215 220

Arg Pro Thr Pro Lys Lys Ser Arg Pro Asp Ile Arg Glu Leu Leu Tyr

225 230 235 240

Met Asp Val Ile Arg Asn Phe Leu Arg Ala Gly Arg Ile Glu Pro Asn

245 250 255

Glu Glu Ala Ile Asn Tyr Tyr Lys Thr Leu Tyr Lys Lys Ala Ala Glu

260 265 270

Ile Arg Lys Ser Ile Ile Lys Lys Ala Pro Leu Thr Glu Glu Gln Lys

275 280 285

Lys Leu Lys Lys Glu Leu Ser Lys Gln Leu Lys Lys Tyr Ile Asn Lys

290 295 300

Asp Tyr Arg Ala Ser Ala Gln Lys Lys Met Leu Glu Gln Ile Lys Val

305 310 315 320

Leu Met Phe Glu Lys Leu Ser Gly Arg Ser Arg Tyr Cys Ile Glu His

325 330 335

Leu Lys Ala Arg Ala Asn Gly Glu Asp Val Glu Ala Gly Tyr His Gly

340 345 350

His Val Gln Lys Arg His Asp Met Asn Ile Ala Gln Lys Asn His Asp
355 360 365
Lys Arg Val Ile Asn Leu Ile Glu Tyr Met Leu Phe Arg Ser Asp Glu
370 375 380
Ser Leu Ala Met Glu Leu Lys Asn Lys Gly Ile Met Tyr Ile Thr Ile
385 390 395 400
Glu Ala Pro Glu Pro Asp Thr Lys Lys Ala Lys Lys Gly Glu Thr Thr

405 410 415
Lys Lys Asp Glu Arg Asn Ile Lys Glu Lys Leu Leu Asp Glu Gln Phe
420 425 430
Asp Val Glu Gly Gln Arg Phe Val Cys Ile Tyr Thr Gly Gln Glu Leu
435 440 445
Ser Lys Gly Arg Leu Asn Glu Tyr Glu Lys Asp His Ile Phe Pro Glu
450 455 460
Ser Arg Asp Gly Pro Ser Ile Arg Asp Asn Leu Val Ile Thr Thr Lys

465 470 475 480
Glu Ile Asn

<210> 479
<211> 935
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG33 effectors
<220><223> Description: MG33-18 effector
<400> 479
Lys Glu Gly Gly Ile Ala Leu Val Lys Asp Asn Gln Val Leu Phe Ala
1 5 10 15
Lys Thr Phe Leu Asp Phe His Lys Glu Asn Leu Lys Asp Arg Arg Thr
20 25 30

His Arg Arg Asn Arg Arg Ser Arg Leu Ala Lys Lys Arg Arg Val Ala

35 40 45

Ile Leu Arg Ser Trp Leu Leu Arg Gln Lys Val Asn Gly Lys Gln Leu

50 55 60

Pro Asp Pro Tyr Lys Ile Lys Asp Thr Pro Leu Phe Lys Arg Thr Asn

65 70 75 80

Ala Lys Asn Trp Ile Asp Ala Val Val Ser Lys Gln Asp Thr Ser Pro

85 90 95

Glu Ala Phe Val Arg Ala Leu Thr Thr Val Phe Arg Lys Arg Gly Gln

100 105 110

Ser Tyr Glu Glu Thr Ala Lys Gln Ile Glu Asp Met Asp Tyr Arg Glu

115 120 125

Leu Lys Asp Tyr Ile Asn Ser Leu Gly Ser Ile Thr Glu Glu Glu Phe

130 135 140

Asn Ala Leu Ser Glu Glu Ile Lys Tyr Arg Ser Glu Ser Ser Glu Thr

145 150 155 160

Ser Ser Glu Lys Asn Arg Tyr Ala Gly Leu Val Asp Ile Leu Lys Thr

165 170 175

Lys Leu Ser Asn Lys Glu Asn Ile Lys Asn Arg Arg Glu Arg Glu Lys

180 185 190

Glu Leu Glu Gln Ile Val Lys Ala Phe Cys Glu Ala Asn Asn Leu His

195 200 205

Glu Ser Asp Lys Trp Ile Ser Gln Leu Lys Ser Leu Leu Asn Lys Pro

210 215 220

Ile Arg Lys Ala Arg Phe Ala Asn Arg Ile Val Ile Arg Cys Asn Ile

225 230 235 240

Cys Asp Arg Pro Thr Pro Lys Lys Ser Arg Pro Asp Ile Arg Glu Leu

245 250 255

Leu Tyr Met Asp Val Ile Arg Asn Phe Leu Arg Ala Gly Arg Ile Glu

260 265 270

Pro Asn Glu Glu Ala Ile Asn Tyr Tyr Lys Thr Leu Tyr Lys Lys Ala

275 280 285

Ala Glu Ile Arg Lys Ser Ile Ile Lys Lys Ala Pro Leu Thr Glu Glu
290 295 300
Gln Lys Lys Leu Lys Lys Glu Leu Ser Lys Gln Leu Lys Lys Tyr Ile
305 310 315 320
Asn Lys Asp Tyr Gly Ala Ser Ala Gln Lys Lys Met Leu Glu Gln Ile
325 330 335
Lys Val Leu Met Phe Glu Lys Leu Ser Gly Arg Ser Arg Tyr Cys Ile
340 345 350

Glu His Leu Lys Ala Arg Ala Asn Gly Glu Asp Val Glu Ala Gly Tyr
355 360 365
His Gly His Val Gln Lys Arg His Asp Met Asn Ile Ala Gln Lys Asn
370 375 380
His Asp Lys Arg Val Ile Asn Leu Ile Glu Tyr Met Leu Phe Arg Ser
385 390 395 400
Asp Glu Ser Leu Ala Met Glu Leu Lys Asn Lys Gly Ile Met Tyr Ile
405 410 415

Thr Ile Glu Ala Pro Glu Pro Asp Thr Lys Lys Ala Lys Lys Gly Glu
420 425 430
Thr Thr Lys Lys Asp Glu Arg Asn Ile Lys Glu Lys Leu Leu Asp Glu
435 440 445
Gln Phe Asp Val Glu Gly Gln Arg Phe Val Cys Ile Tyr Thr Gly Gln
450 455 460
Glu Leu Ser Lys Asp Arg Leu Asn Glu Tyr Glu Lys Asp His Ile Phe
465 470 475 480

Pro Glu Ser Arg Asp Gly Pro Ser Ile Arg Asp Asn Leu Val Ile Thr
485 490 495
Thr Lys Glu Ile Asn Lys Glu Lys Gly Asp Arg Thr Pro Trp Glu Trp
500 505 510
Leu His Asp Asp Pro Val Lys Trp Gln Glu Phe Lys Asn Arg Val Met
515 520 525
Arg Leu Tyr Ser Ser Gly Lys Ile Thr Glu Arg Lys Lys Gly Ile Leu

530 535 540

Leu Asn Glu Gly Ser Glu Phe Pro Met Asp Asn Pro Thr Glu Leu Ala
545 550 555 560
Arg Ala Gly Ala Arg Val Asn Asn Phe Ile Ala Asp Leu Asn Glu Met
565 570 575
Leu Lys Lys His Gly Leu Pro Glu Ala Gln Thr Leu Phe Glu Lys Gly
580 585 590
Lys Pro Ile Val Gln Ile Val Arg Gly Ser Glu Thr Gln Arg Leu Arg
595 600 605

Arg Gln Trp Asn Ala Ile Asp Pro Ser Phe Ile Pro Leu Lys Asp Arg
610 615 620
Ala Val Ser Phe Asn His Ala Glu Asp Ala Val Ile Ala Ala Ser Met
625 630 635 640
Pro Pro Thr Phe Trp Arg Ser Gln Ile Tyr Arg Tyr Thr Trp His Phe
645 650 655
Ala Thr Ser Lys Glu Arg Ser Asp Phe Ala Leu Pro Asp Ile Ala Pro
660 665 670

His Trp Asn Asp Phe Ile Ala Lys Arg Asn Ser Pro Ile Ile Ala Val
675 680 685
Leu Gly Lys Thr Lys Tyr Ser Trp Lys Asn Ser Gly Ser Ile Phe Asp
690 695 700
Asp Thr Leu Tyr Lys Lys Tyr Asn Ser Arg Ala Phe Phe Lys Glu Ile
705 710 715 720
Tyr Lys Gln Pro Gly Ser Lys Glu Asn Asp Asp Asp Lys Ile Asn Gln
725 730 735

Pro Thr Lys Pro Ile Pro Ile Asp Glu His Lys Met Asp Pro Asn Tyr
740 745 750
Lys Tyr Tyr His Val Lys Val Gly Asn Lys Arg Phe Leu Ile Lys Ser
755 760 765
Gln Lys Gly Gly Ser Leu Ile Thr Ile Lys Pro Lys His Thr Leu Trp
770 775 780

Pro Arg Thr Ile Gln Val Asn Pro Thr Tyr Gly Ser Val Val Leu Thr
785 790 795 800

Lys Gly Asp Lys Gly Glu Ile Glu Leu His Tyr Thr Pro Ile Ser Pro
805 810 815
Ile Met Ser Met Tyr Lys Gln Gly Ile Ile Leu Asp Met Asp Glu Arg
820 825 830
Leu Lys Arg Ala Leu Ser Asp Lys Met Arg Tyr Glu Gly Pro Lys Lys
835 840 845
Glu Leu Arg Val His Asp Ile Ile Tyr Leu Pro Ala Thr Lys Arg His
850 855 860

Gly Glu Gly Tyr Phe Leu Val Thr Lys Leu Gly Arg Ser Gly Val Lys
865 870 875 880
Val Val Pro Glu Asp Lys Leu Lys Ile Arg Tyr Thr Lys Gln Asn Ser
885 890 895
Lys Asp Leu Gly Ser Glu Ser Gly Lys Asp Lys Ala Lys Asp Lys Ser
900 905 910
Val Glu Ile Gly Leu Asn Glu Glu Asp Leu Leu Tyr Leu Tyr Asn Asn
915 920 925

Pro Asp Ser Ile Arg Ile Lys
930 935

<210> 480
<211> 1268
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG33 effectors
<220><223> Description: MG33-19 effector
<400> 480
Met Ile Thr Gln Glu Ile Glu Thr Thr Thr Trp Arg Gln Arg Leu Leu
1 5 10 15
Lys Glu Lys Val Lys Pro Phe Leu Leu Ser Thr Arg Ile Gly Ile Asp

20 25 30

Phe Gly Glu Gly Lys Gly Gly Ile Ala Val Glu Gln Gly Arg Glu Glu
35 40 45
Asn Gly Lys Ile Val Asn Glu Ile Arg His Ala Glu Val Phe Cys Asp
50 55 60
Phe His Ala Ala Thr Leu Lys Asp Arg Arg Asp Asn Arg Arg Gly Arg
65 70 75 80
Arg Thr Arg Arg Ala Lys Lys Ile Arg Leu Ala Arg Leu Arg Ser Trp
85 90 95

Ile Leu Arg Gln Pro Asp Pro Thr Lys Asn Ile Asp Met Ala Ser Trp
100 105 110
Leu Lys Arg Pro Val Ser Leu Pro Arg Asp Lys Arg Leu Pro Asp Pro
115 120 125
Tyr Val Leu Met Arg Asp Glu Lys Phe Gln Cys Gln Pro Phe Glu Tyr
130 135 140
Lys Val Gly Lys Lys Gln Leu Asp Ala Lys Thr Asn Tyr Lys Lys Glu
145 150 155 160

Ser Asp Asn Pro Asn Phe Leu Leu Pro Thr Trp Ile Glu Ala Val Lys
165 170 175
Asn Gly Lys Cys Thr Asp Ser Ala Ser Phe Val Ile Ala Leu Thr His
180 185 190
Ile Phe Gln Lys Arg Gly Tyr Ser Tyr Ser Asp Ala Asp Leu Glu Glu
195 200 205
Leu Thr Asp Ala Gln Leu Glu Asp Phe Leu Ala Ser Ser Ala Leu Arg
210 215 220

Asn Ser Pro Asp Asp Phe Lys Lys Lys Ile Lys Ala Gln Val Glu Arg
225 230 235 240
Arg Glu Val Ala Ser Glu Asp Glu Asp Gln Ser Trp Arg Gly Lys Glu
245 250 255
Lys Val Asp Tyr Glu Glu Leu Lys Pro Gln Phe Asp Gln Ala Cys Asn
260 265 270

Arg Ser Pro Gln Arg Arg Lys Ala Val His Arg Arg Glu Lys Val Gln
275 280 285

Leu Leu Asn Gln Val Ile Glu Ser Phe Ile Asn Ser Ile Ser Thr Leu
290 295 300
Glu Ala Gln Thr Lys Lys Asp Leu Ile Thr Lys Trp Gln Arg Ala Leu
305 310 315 320
Ala Gly Asp Leu Asp Gln Asp Phe Asp Pro Arg Lys Asn Pro Lys Gly
325 330 335
Leu Ile Asn Lys Val Val Arg Ala Pro Arg Phe Asp Asn Arg Val Glu
340 345 350

Ser Gly Cys Ala Trp Cys Gly Lys Thr Cys Ala Arg Lys Ser Lys Asn
355 360 365
Arg Lys Lys Ala Tyr Leu Ala Ala Val Asn Asn Leu Arg Val Tyr Glu
370 375 380
Val Pro Pro Ser Ser Ala His Leu Ala Lys Glu Arg Lys Gly Arg Leu
385 390 395 400
Ala Asp Leu Trp Gln Glu Gly Leu Lys Asn Pro Ala Glu Ala Arg Gln
405 410 415

Arg Phe Leu Asn Ser Cys Arg His Phe Gly Ile Pro Lys Asp Lys Gln
420 425 430
Arg Glu Phe Ala Gly Leu Phe Asp Asn Trp Arg Ala Gly Ser Glu Glu
435 440 445
Ala Asn Gln Lys Ile Lys Asn Leu His Val Lys Leu Val Gly Gln Lys
450 455 460
Pro Arg Lys Leu Thr Lys Glu Ala Gly Lys Lys Phe Glu Asp Ile Trp
465 470 475 480

Lys Lys Asp Val Pro Gln Glu Asn Val Ser Gln Asp Asn Gln Phe Trp
485 490 495
Lys Asn Leu Ser Gln Lys Val Ser Glu Val Phe Thr Glu Leu Arg Lys
500 505 510
Gly Gly His Pro Val Ile Lys Glu Glu Met Lys Lys Gln Leu Thr Asp

515 520 525

Leu Leu Ala Val Lys Pro Lys Gly Arg His Arg Leu Cys Ser Ala Cys

530 535 540

Leu Asp Lys Ala Ala Lys Gly Glu Thr Met Phe Asp Gln Gly Ile Asp

545 550 555 560

Pro Trp Thr Ile Lys Ala Arg Ser Val Arg Asn Pro Arg Arg Glu Gln

565 570 575

His Gln Gln Arg Val Leu Ala Arg Leu Glu Tyr Leu Leu Phe Lys Ala

580 585 590

Arg Arg Arg Arg Pro Asp Gly Ser Lys Val Val Pro Asp Pro Arg Gln

595 600 605

Ile Lys Tyr Ile Thr Leu Glu Ile Pro Lys Pro Gln Ser Thr Asn Arg

610 615 620

Thr Lys Lys Gly Glu Gln Thr Lys Thr Glu Arg Arg Ser Ile Lys Ala

625 630 635 640

Leu Leu His Glu Glu Ala Phe Gly Lys Cys Ile Tyr Cys Asp Thr Asp

645 650 655

Ile Ser Val Asp Gln Val Thr Glu Asp His Ile Phe Pro Glu Ser Trp

660 665 670

Gly Gly Pro Asp Ile Arg Asp Val Asn Leu Val Cys Ser Cys His Asn

675 680 685

Cys Asn Asp Gly Lys Arg Asn Ser Ile Pro Tyr Leu Trp Ser Gln His

690 695 700

Ile Lys Pro Ser Trp Gln Glu Phe Glu Lys Arg Val Arg Leu Asn Ser

705 710 715 720

Arg Met Pro Ala Arg Lys Lys Asp Ile Leu Leu Leu Gly Ser His Gly

725 730 735

Gly Lys Ile Glu Asn Leu Glu Ser Phe Lys Ala Leu Gly Ile Pro Leu

740 745 750

Glu Arg Leu Thr Asp Glu Gln Arg Asn Glu Phe Ala Ala Leu Ala Asn

755 760 765

Trp Lys Gln Gly Asp Pro Phe Pro Asn Asp Pro Thr Ala Leu Ala Arg
770 775 780
Ala Gly Ala Met Pro Arg Gln Phe Ile Gln Gly Ile Arg Lys Met Phe
785 790 795 800

Glu Ala His Gly Phe Lys Glu Asp Glu Leu Pro Val Ile Thr Pro Lys
805 810 815
Gly Asp Leu Pro Leu Met Gln Arg Ala Glu Gly Trp Met Thr Ser Arg
820 825 830
Leu Arg Asn Ser Trp Arg Arg Asp Gln Asn Gly Gln Glu Asn Phe Pro
835 840 845
Met Lys Arg Ser Glu Glu Ser Leu Glu His His Val Gln Asp Ala Ala
850 855 860

Leu Leu Ala Ala Leu Pro Pro His Gln Trp Arg Asp His Val Phe Ile
865 870 875 880
Asp Ile Glu Lys His Ala Arg His Asp Glu Lys Gly Asp Pro Val Arg
885 890 895
Asp Ala Asn Gly Lys Pro Ile Met Asn Glu Phe Thr Val Ala Leu Lys
900 905 910
Glu Leu Ala Pro Asn Trp Pro Glu Phe Lys Gly Ser Arg Lys Gln Pro
915 920 925

Leu Val Arg Ile Leu Glu Ser Ser Arg Gln Ser Trp Arg Lys Ser Trp
930 935 940
Arg Ser Gln Phe Ile Lys Lys Ser Phe Trp Gln Ile Phe Cys Pro Asn
945 950 955 960
Lys Lys Cys Asn Leu Tyr Ile Lys Pro Glu Ser Leu Lys Gly Asn Gly
965 970 975
Glu Ile Lys Cys Lys Lys Cys Gly Thr Ala Leu Arg Arg Asn Gly Ser
980 985 990

Gly Phe Leu Asn Val Glu Ile Arg Gln Tyr Lys Pro His Trp Glu Ser
995 1000 1005
Leu Val Lys Cys Pro His Cys Gln Gln Glu Leu Lys Glu Leu Lys

1010 1015 1020

Arg Asn Gly Thr Ile Val Gly Lys Gln Cys Lys Asn Lys Arg Cys

1025 1030 1035

Lys Thr Lys Phe Phe Gln Ser Asp Leu Gln Gly Gln Val Arg Gln

1040 1045 1050

Arg Lys Lys Ser Gln Gln Gln Gly Lys Val Leu Ala Ile Arg Pro

1055 1060 1065

His Asn Gly Pro Ile Arg Ile Val Asn Val Glu Ala Val Ala Asp

1070 1075 1080

Ala Ile Cys Leu Val Lys Lys Lys Asp Lys Ala Asn Ser Gln Ile

1085 1090 1095

His Leu Arg Leu Gln Pro Ala Ile Ala Ser Phe Thr Gly Ala Glu

1100 1105 1110

Phe Asp Pro Pro Leu Pro Ala Asn Gly Glu Ile Ile Gly Glu Ile

1115 1120 1125

Arg Arg Asn Lys Phe Ile Asp Leu Pro Glu Lys Asn Lys Lys Leu

1130 1135 1140

Pro Val Phe Leu Leu Gln Asp Thr Lys Thr Lys Lys Asn Ile Cys

1145 1150 1155

Tyr Pro Ser Ala Leu Cys Gln Phe Ile Asn Ile Thr Ser Ile Lys

1160 1165 1170

Ser Gly Val Lys Asn Val Asn Phe Val Phe Pro Gln Gly Arg Tyr

1175 1180 1185

Arg Val Lys Glu Leu Ser Ile Lys Asn Ala Glu Val Trp Phe Glu

1190 1195 1200

Ser Ile Ala Gly Gly Val Lys Lys Asp Tyr Trp Cys Cys Pro Val

1205 1210 1215

Leu Gln Lys Glu Arg Leu Thr Asp Asn Glu Ile Lys Glu Leu Lys

1220 1225 1230

Asp Lys Lys Glu Ala Val Phe Lys Asn Phe Pro Glu Arg Lys Leu

1235 1240 1245

Gly Ile Arg Glu Leu Arg Glu Leu Cys Lys Ile Lys Ser Lys Lys
1250 1255 1260

Ser Trp Pro Lys Lys
1265

<210> 481

<211> 448

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG33 effectors

<220><223> Description: MG33-20 effector

<400
> 481

Thr Arg Glu Asn Leu Glu Lys Tyr Leu Glu Ser Ile Asn Ala Glu Lys
1 5 10 15

Arg Trp Thr Arg Asp Arg Lys Gly Arg Trp Lys Leu Ala Phe Pro Met
20 25 30

Leu Ser Gln Leu Asn Asp Leu Leu Asn Arg Thr Pro Arg Gln Gly Arg
35 40 45

Ala Ser Leu Cys Leu Ala His Leu Lys Met Ala Ala Asp Gly Lys Thr
50 55 60

Met Lys Asp Ala Gly Val Asp Trp Gln Thr Leu Ser Thr Arg Tyr Ala
65 70 75 80

Ser Asn Pro Ala Arg Glu Gln Arg Asp Ala Arg Ile Leu Tyr Arg Leu
85 90 95

Glu Arg Leu Leu Phe Val Pro Gly Lys Arg Gly Ala Glu Ala Trp Arg
100 105 110

Tyr Gly Pro Val Ser Ile Ile Ser Leu Glu Val Pro Glu Pro Gln Thr
115 120 125

Gln Gln Val Gly Pro Arg Gln Met Thr Glu Arg Lys Glu Gly Ser Phe
130 135 140

Lys Glu Arg Leu Leu Gln Glu Leu Lys Ser Gln Cys Val Tyr Cys Trp

145 150 155 160

Lys Asn Ala Gly Asp Lys Asp His Ile Phe Pro Arg Ala Lys Gly Gly

165 170 175

Pro Asp Ile Trp Asp Asn Leu Ile Ala Ser Cys Lys Ser Cys Asn Asp

180 185 190

Glu Lys Gly Asp Arg Thr Pro Phe Glu Trp Phe Gly Ala Asp Ala Gln

195 200 205

Arg Trp Glu Ala Phe Thr Gln Arg Val Glu Ser Leu Pro Ile Ser Glu

210 215 220

Arg Lys Lys Gln Val Leu Leu Asn Gln Met Asp Asp Phe Pro Gly Gly

225 230 235 240

Asp Pro Thr Pro Phe Ala Arg Ile Gly Ala Arg Pro Arg Gln Phe Val

245 250 255

Ala Ala Ile Gln Ala Leu Phe Arg Arg Tyr Gly Val Glu Pro Pro Thr

260 265 270

Leu Ala Phe Gln Thr Gly Val Pro His Ile Gln Arg Val Glu Gly Arg

275 280 285

Leu Thr Ala Lys Leu Arg Glu Ser Trp Arg Phe Arg Ala Asp Asn Arg

290 295 300

Thr Glu Asn Phe Pro Asp Lys Asn Pro Trp Asp Leu Arg Asn His Ala

305 310 315 320

Gln Asp Ala Val Leu Val Ala Ser Cys Pro Pro His Thr Trp Arg Asp

325 330 335

Leu Met Phe Cys Ala Glu Gly Glu Arg Leu Asn Arg Glu Arg Lys Leu

340 345 350

Val Pro Lys Pro Gly Leu Ala Ile Gln Glu Leu Ala Pro Asp Trp Thr

355 360 365

Glu Phe Ser Arg Asn Asn Val Gly Pro Leu Val Arg Val Leu Gly Arg

370 375 380

Tyr Pro Val Gly Trp Lys Lys Thr Ile Phe Lys Gln Thr Leu Trp Gln

385 390 395 400

Asp Pro Lys Lys Thr Ala Lys Ala Lys Leu Val Val Arg Lys Ser Val
405 410 415
Thr Lys Leu Thr Val Gly Glu Leu Gln Glu Ile Val Ser Pro Tyr Tyr
420 425 430
Arg Asp Gln Leu Gln Ala Leu Ala Arg Arg Leu Gln Ile Lys Asn Lys
435 440 445

<210> 482
<211> 579
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG33 effectors
<220><223> Description: MG33-21 effector
<400> 482
Met Lys Met Gly Arg Gln Leu Phe Asp Leu Leu Trp Asn Asp Gln Pro
1 5 10 15
Thr Gly Arg Ala Ser Leu Cys Arg Lys His Leu Glu Asp Ala Ala Leu
20 25 30
Gly Lys Thr Met Lys Asp Ala Gly Val Glu Trp Gln Thr Ile Ser Val

35 40 45
Arg Lys Ala Pro Asn Pro Cys Arg Glu Gln His Asp Lys Arg Val Leu
50 55 60
His Arg Leu Glu Gln Ile Leu Phe Arg Pro Gly Glu Ser Gly Glu Asn
65 70 75 80
Ala Trp Arg Tyr Gly Pro Val Gln Phe Ile Thr Leu Glu Val Pro Ala
85 90 95
Pro Gln Thr Glu Gln Ala Arg Lys Gly Glu Met Lys Thr Arg Lys Pro

100 105 110
Glu Pro Phe Met Val Arg Leu Ala Lys Glu Thr Gly Gly Val Cys Ile
115 120 125
Tyr Cys Asp Ser Ala Asn Pro Arg Pro Ala Glu Asp Lys Asp His Val

130 135 140

Phe Pro Gln Ser Arg Gly Gly Pro Asp Val Trp Asp Asn Leu Val Pro

145 150 155 160

Ala Cys Lys Ala Cys Asn Lys Glu Lys Asp Asn Arg Thr Pro Phe Glu

165 170 175

Trp Phe Arg Asp Pro Gln Gly Trp Gln Ala Phe Thr Val Arg Val Asn

180 185 190

Glu Leu Ala Asp Lys Gly Val Pro Ala Pro Val Glu Pro Glu Glu Ala

195 200 205

Gly Lys Lys Lys Thr Gln Pro Pro Arg Phe Ile Arg Ile Ser Asp Arg

210 215 220

Lys Arg Met Leu Leu Leu Ser Thr Glu Pro Ala Phe Pro Glu Asn Pro

225 230 235 240

Thr Ala Leu Ala His Val Gly Ala Arg Pro Arg Gln Phe Val Val Glu

245 250 255

Leu Gly Gln Leu Phe Arg Ser Arg Gly Val Lys Pro Ala Arg Ile Asp

260 265 270

Tyr Gln Leu Gly Glu Pro Leu Val Gln Arg Ile Asp Gly Arg Thr Thr

275 280 285

Thr Gln Leu Arg Lys Ser Trp Leu Lys Lys Ala Asp Glu Thr Thr Asp

290 295 300

Asn Phe Pro Pro Lys Asn Arg Trp Asp Leu Ala Asn His Ala Gln Asp

305 310 315 320

Ala Ala Leu Ile Ala Ala Cys Pro Pro His Thr Trp Arg Asp Thr Val

325 330 335

Phe Cys His Arg Ala Val Arg Pro Asn Phe Ala Gly Lys Trp Val Asp

340 345 350

Gln Asp Gly Leu Ala Thr His Asp Leu Ala Pro Asp Trp Ala Glu Tyr

355 360 365

Met Glu Asn Arg Thr Trp Pro Leu Val Arg Val Leu Gly Arg Tyr Pro

370 375 380

Val Gly Trp Lys His Thr Phe Ala Asp Gln Asn Phe Tyr Gln Asn Pro
385 390 395 400
Glu Lys Leu Asp Asp Lys Lys Leu Leu Gln Tyr Val Pro Leu Val Gln
405 410 415
Leu Lys Tyr Ser Gly Thr Gly Pro Asp Glu Lys Arg His Pro Ser Glu

420 425 430
Thr Glu Ile Val Ser Pro Arg Leu Asp His Glu Phe Arg Asp Leu Ala
435 440 445
Gln Arg Leu Val Lys Glu Arg Glu Ala Trp Ile Glu Ala His Pro Lys
450 455 460
Pro Asp Lys Glu Leu Arg Lys Glu Gly Gln Glu Leu Gly Leu Thr Ala
465 470 475 480
Asn His Thr Ile Pro Lys Glu Arg Leu Glu Asp Ser Pro Gln Phe Arg

485 490 495
Asn Val Arg His Val Lys Val Gln Lys Gln Pro Gly Gly Lys Leu Val
500 505 510
Arg Val Lys Pro Leu Asp Gly Pro Ala Arg Lys Ile Gln Ala Lys Glu
515 520 525
Ala Ser Glu Gly Ala Val Val Trp Phe Ile Pro Pro Lys Leu Gly Ser
530 535 540
Lys Gly Lys Pro Arg Leu Lys Ile Ser Ile Ala Trp Pro Met Ala Leu

545 550 555 560
Arg Lys Phe Gly Val Pro Lys Phe Glu Pro Ala Ile Pro Pro Asp Ala
565 570 575
Thr Ile Ile

<210> 483
<211> 344
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG33 effectors

<220><223> Description: MG33-22 effector

<400> 483

Arg Ser Ala Cys Arg Thr His Gln Glu Asp Ala Ala Leu Arg Lys Thr
1 5 10 15

Met Lys Asp Ala Gly Val Glu Trp Gln Thr Ile Ser Val Arg Lys Ala
20 25 30

Pro Asn Pro Cys Arg Glu Gln His Asp Lys Arg Val Leu His Arg Leu
35 40 45

Glu Gln Ile Leu Phe Leu Pro Gly Glu Ser Gly Asp Lys Ala Trp Arg
50 55 60

Tyr Gly Pro Val Gln Phe Val Thr Leu Glu Val Pro Thr Pro Gln Thr
65 70 75 80

Glu Gln Ala Arg Lys Gly Glu Met Lys Thr Arg Lys Pro Glu Pro Phe
85 90 95

Met Val Arg Leu Ala Lys Glu Thr Gly Gly Val Cys Ile Tyr Cys Asp
100 105 110

Pro Ala Asn Pro Arg Pro Ala Glu Asp Lys Asp His Val Phe Pro Gln
115 120 125

Ser Arg Gly Gly Pro Asp Val Trp Asp Asn Leu Val Pro Ala Cys Lys
130 135 140

Ala Cys Asn Lys Glu Lys Ala Asn Arg Thr Pro Phe Glu Trp Leu Arg
145 150 155 160

Asp Pro Gln Arg Trp Gln Ala Phe Thr Val Arg Val Asn Glu Leu Ala
165 170 175

Asp Arg Gly Val Pro Ala Pro Gly Glu Pro Glu Glu Ala Glu Ala Lys
180 185 190

Lys Thr Pro Pro Pro Arg Thr Ile Arg Ile Ser Asp Arg Lys Arg Met
195 200 205

Leu Leu Leu Ser Thr Glu Pro Ala Tyr Pro Glu Asn Pro Thr Ala Leu
210 215 220

Ala His Val Gly Ala Arg Pro Arg Gln Phe Val Val Glu Leu Gly Gln
225 230 235 240
Leu Phe Arg Ser Arg Gly Val Lys Pro Pro Arg Ile Asp Tyr Gln Leu
245 250 255
Gly Glu Pro Leu Val Gln Arg Ile Asp Gly Arg Thr Thr Thr Gln Leu
260 265 270

Arg Lys Ser Trp Leu Lys Lys Ala Asp Glu Thr Thr Asp Asn Phe Pro
275 280 285
Ala Lys Asn Arg Trp Asp Leu Thr Asn His Ala Gln Asp Ala Ala Leu
290 295 300
Ile Ala Ala Cys Pro Pro His Thr Trp Arg Asp Thr Val Phe Cys His
305 310 315 320
Arg Asp Ala Arg Pro Asn Phe Ala Gly Gln Trp Val Ser Ala Asp Gly
325 330 335

Leu Ala Thr Tyr Asp Ser Gly Thr
340

<210> 484
<211> 302
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG33 effectors
<220><223> Description: MG33-23 effector
<400> 484
Met Leu Asn Ser Ala Leu Thr Thr Arg Leu His Asp Phe Leu Pro Thr
1 5 10 15
Val Arg Val Gly Val Asp Phe Gly Glu Gly Ala Gly Gly Ile Ala Val
20 25 30

Val Lys Gly Asn Gln Ile Leu His Ala Glu Thr Tyr Val Asp Phe His
35 40 45
Glu Thr Thr Leu Glu Lys Arg Arg Gln Leu Arg Arg Gly Arg Arg Thr

50 55 60

Arg His Ser Lys Ala Met Arg Leu Ala Arg Leu Arg Ser Trp Val Leu

65 70 75 80

Arg Gln Lys Leu Pro Asp Gly Thr Arg Leu Pro Asp Pro Tyr Asp Val

85 90 95

Met His Thr Leu Arg Leu His Val Gln Pro Gly Val Tyr Glu Lys Ala

100 105 110

Gly Thr Asp Pro Leu Lys Ala Pro Ser Trp Ile Asp Leu Val Lys Gln

115 120 125

Gly Arg Gly Asp Ala Glu Ala Phe Val Lys Ala Leu Thr Leu Ile Phe

130 135 140

Gln Lys Arg Gly Tyr Lys Trp Asp Ser Ile Ala Leu Glu Glu Met Thr

145 150 155 160

Asp Ala Lys Leu Lys Asp Phe Leu Thr Thr Ala Arg Ile Pro Asn Asn

165 170 175

Asp Leu Tyr Ala Asp Val Arg Ala Gln Ile Lys Arg Arg Glu Asp Asp

180 185 190

Ser Asp Asp Pro Val Arg Gly Arg Ser Lys Val Ser Pro Thr Glu Leu

195 200 205

Leu Asp Leu Leu Val Arg Ala Arg Asn Arg Gln Gln Gln Pro Arg Gln

210 215 220

Ala Glu His Arg Ser Val Lys Ser Ala Glu Leu Val Glu Val Ile Asp

225 230 235 240

Gly Phe Gly Lys Ser Ala Gly Val Ala Leu Thr Thr Ile Gln Arg Trp

245 250 255

Gln Arg Glu Leu Cys Gly Val Pro Gly Glu Asn Gly Lys Glu Lys Phe

260 265 270

Gly Leu Leu Asn Lys Val Leu Arg Pro Ala Arg Phe Glu Asn Arg Leu

275 280 285

Arg Thr Gly Cys Ala Trp Cys Gly Lys Pro Thr Pro Arg Lys

290 295 300

<210> 485

<211> 700

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG33 effectors

<220><223> Description: MG33-24 effector

<400> 485

Ser Ala Leu His Pro Pro Ala Arg Ile Pro Asn Glu Ala Leu Val Ala

1 5 10 15

Asp Val Arg Ala Gln Ile Lys Arg Arg Glu Asp Asp Ser Asp Asp Pro

20 25 30

Val Arg Gly Lys Ser Lys Val Ser Pro Ala Glu Leu Leu Ala Leu Leu

35 40 45

Glu Lys Ala Arg Asn Arg Gln Pro Gln Pro Arg Gln Ala Glu His Arg

50 55 60

Ser Val Lys Ala Ala Glu Leu Ile Glu Val Ile Ala Gly Phe Gly Lys

65 70 75 80

Ser Ala Gly Ile Pro Ser Ala Thr Leu Gln Arg Trp Gln Gln Glu Leu

85 90 95

Cys Gly Phe Asn Asn Lys Asn Gly Glu Glu Arg Phe Gly Leu Leu Asn

100 105 110

Lys Val Leu Arg Pro Ala Arg Phe Glu Asn Arg Leu Arg Thr Gly Cys

115 120 125

Ala Trp Cys Gly Lys Pro Thr Pro Arg Lys Ala Lys Val Arg His Val

130 135 140

Ala Tyr Cys Ala Ala Val Cys Asn Leu Arg Ile Arg Glu Gly Arg Arg

145 150 155 160

Val Arg Pro Leu Asn Lys Pro Glu Ala Glu Val Phe Trp Glu Trp Trp

165 170 175

Arg Leu Arg Glu Ala Ala Ala Leu Thr Glu Lys Gln Gln Ser Gly Lys

180 185 190

Leu Ala Gln Glu Gly Ala Lys Lys Pro Pro Lys Gly Thr Asp Ala Pro

195 200 205

Lys His Glu Thr Ile Lys Lys His Leu Gln Arg Leu Gly Ala Gln Asp

210 215 220

Lys Met Ala Arg Gln Ile Ser Asp Leu Leu Trp Asn Glu Asn Ala Lys

225 230 235 240

Gly Arg Ala Ser Leu Cys Arg Lys His Leu Glu Asp Ala Ala Leu Gly

245 250 255

Lys Thr Met Lys Asp Ala Gly Val Glu Trp Gln Thr Ile Ser Val Arg

260 265 270

Lys Ala Pro Asn Pro Cys Arg Glu Gln His Asp Lys Arg Val Leu His

275 280 285

Arg Leu Glu Gln Ile Leu Phe Arg Pro Gly Glu Ser Gly Asp Lys Ala

290 295 300

Trp Arg Tyr Gly Pro Val Gln Phe Val Thr Leu Glu Val Pro Thr Pro

305 310 315 320

Gln Thr Glu Gln Ala Arg Lys Gly Glu Met Lys Thr Arg Lys Pro Glu

325 330 335

Pro Phe Met Val Arg Leu Ala Lys Glu Thr Gly Gly Val Cys Ile Tyr

340 345 350

Cys Asp Pro Ala Asn Pro Arg Pro Ala Glu Asp Lys Asp His Val Phe

355 360 365

Pro Gln Ser Arg Gly Gly Pro Asp Val Trp Asp Asn Leu Val Pro Ala

370 375 380

Cys Lys Ala Cys Asn Lys Glu Lys Ala Asn Arg Thr Pro Phe Glu Trp

385 390 395 400

Leu Arg Asp Pro Gln Arg Trp Gln Ala Phe Thr Val Arg Gly Thr Glu

405 410 415

Leu Ala Asp Arg Gly Val Pro Ala Pro Gly Glu Pro Glu Glu Ala Glu

420 425 430

Ala Lys Lys Thr Pro Pro Pro Arg Thr Ile Arg Ile Ser Asp Arg Lys
435 440 445
Arg Met Leu Leu Leu Ser Thr Glu Pro Ala Tyr Pro Glu Asn Pro Thr
450 455 460
Ala Leu Ala His Val Gly Ala Arg Pro Arg Gln Phe Val Val Glu Leu

465 470 475 480
Gly Gln Leu Phe Arg Ser Arg Gly Val Lys Pro Pro Arg Ile Asp Tyr
485 490 495
Gln Leu Gly Glu Pro Leu Val Gln Arg Ile Asp Gly Arg Thr Thr Thr
500 505 510
Gln Leu Arg Lys Ser Trp Leu Lys Lys Ala Asp Glu Thr Thr Asp Asn
515 520 525
Phe Pro Ala Lys His Arg Trp Asp Leu Thr Asn His Ala Gln Asp Ala

530 535 540
Ala Leu Ile Ala Ala Cys Pro Pro His Thr Trp Arg Asp Thr Val Phe
545 550 555 560
Cys His Arg Ala Ala Arg Pro Asn Phe Ala Gly Gln Trp Val Asp Gln
565 570 575
Asp Gly Leu Ala Thr His Asp Leu Ala Pro Asp Trp Ala Glu Tyr Met
580 585 590
Glu Asn Arg Thr Trp Pro Leu Val Arg Val Leu Gly Arg Tyr Pro Val

595 600 605
Gly Trp Lys His Thr Phe Ala Asp Gln Asn Phe Tyr Gln Asn Pro Glu
610 615 620
Lys Leu Asp Asp Lys Lys Leu Leu Gln Tyr Val Pro Leu Val Gln Leu
625 630 635 640
Lys His Ser Gly Thr Gly Pro Asp Glu Lys Arg His Pro Ser Glu Thr
645 650 655
Glu Ile Val Ser Pro Arg Leu Asp His Glu Phe Arg Asp Leu Ala Gln

660 665 670
Arg Leu Gly Lys Glu Arg Glu Ala Gly Ile Glu Ala His Pro Gln Pro

675 680 685

His Asn His Cys Ser Ala Arg Arg Lys Lys Lys Lys

690 695 700

<210> 486

<211> 336

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG33 effectors

<220><223> Description: MG33-26 effector

<400> 486

Ala Glu Ile Gly Ala Ile Ile Asp Gly Phe Gly Arg Ala Thr Ala Leu

1 5 10 15

Ser Val Glu Thr Leu Ala Gln Trp Lys Arg Glu Leu Val Gly Ala Lys

20 25 30

Asp Gly Asn Gly Gly Tyr Gln His His Gly Leu Leu Asn Lys Val Leu

35 40 45

Arg Pro Ala Arg Phe Asp Asn Arg Leu Arg Ser Gly Cys Ser Trp Cys

50 55 60

Gly Lys Lys Thr Pro Arg Lys Tyr Lys Val Arg Glu Ile Ala Tyr Arg

65 70 75 80

Ala Ala Val Asn Asn Leu Arg Ala Arg Ala Gly Trp Arg Glu Arg Pro

85 90 95

Leu Thr Ala Asp Glu Lys Asn Gln Phe Leu Asn Trp Trp Asn Asp Arg

100 105 110

Gln Asn Ala Pro Gly Leu Ala Thr Ile Lys Lys Arg Leu Thr Arg Leu

115 120 125

Asn Pro Gln Gln Val Arg Met Ala Asn Gln Leu His Asp Leu Leu Lys

130 135 140

Asp Gln Gln Pro Lys Gly Arg Ala Ser Leu Cys Lys Glu His Leu Gln

145 150 155 160

Met Ala Ala Asn Gly Lys Thr Met Lys Asp Ala Gly Val Asp Trp Gln
165 170 175
Ser Ala Arg Ile Arg Asn Ala Pro Asn Pro Gln Arg Glu His His Asp
180 185 190
Lys Arg Val Leu His Arg Leu Glu Gln Ile Leu Phe Val Lys Gly Lys

195 200 205
Ser Gly Glu Asn Ala Trp Arg Tyr Gly Pro Val Ser Leu Ile Ser Leu
210 215 220
Glu Val Pro Glu Pro Gln Thr Glu Arg Leu Lys Pro Gly Gln Val Pro
225 230 235 240
Glu Arg Gln Gln Glu Thr Phe Lys Gln Arg Leu Leu Lys Glu Leu Ser
245 250 255
Asp Lys Cys Val Tyr Cys Asp Gly Pro Ala Val Asp Lys Asp His Ile

260 265 270
Phe Pro Arg Ser Lys Gly Gly Pro Asp Ile Trp Asp Asn Leu Val Ala
275 280 285
Ala Cys Lys Ser Cys Asn Asp Gln Lys Gly Asp Arg Thr Pro Phe Gln
290 295 300
Trp Leu Gly Ser Asn Ala Ala Lys Trp Ile Asp Phe Ser Arg Arg Val
305 310 315 320
Asn Asp Leu Pro Leu Gly Asn Arg Lys Arg Gln Leu Leu Leu Asn Glu

325 330 335

<210> 487

<211> 680

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG34 effectors

<220><223> Description: MG34-23 effector

<400> 487

Met Glu Lys Glu Leu Val Leu Gly Ile Asp Tyr Gly Gly Lys Tyr Thr

1 5 10 15

Gly Leu Gly Val Val Asp Arg Arg Asn Asn Gln Val Leu Tyr Ala Arg

20 25 30

Thr Ile Lys Met Arg Asp Asp Val Ala Asp Ile Leu Lys Gly Arg Arg

35 40 45

Glu Gln Arg Gly Ile Arg Arg Thr Gln Gln Thr Arg Lys Lys Arg Leu

50 55 60

Arg Glu Leu Lys Lys Tyr Leu Asn Ser Ile Gly Tyr Asp Asn Ser Thr

65 70 75 80

Glu Leu Phe Lys Ser Ile Tyr Ser Leu Ala His Lys Arg Gly Tyr Asp

85 90 95

Tyr Ala Asp Met Pro Thr Pro Glu Glu Ile Glu Glu Met Asp Glu Lys

100 105 110

Glu Lys Lys Glu Trp Lys Asp Thr Gln Arg Asn Ser Arg Tyr Arg Lys

115 120 125

Glu Val Leu Ala Asp Val Arg Lys Val Met Ser Asn Gly Gly Ala Ser

130 135 140

Asp Glu Gln Ile Lys Arg Val Glu Ser Ile Phe Asn Lys Gln Tyr Arg

145 150 155 160

Pro Lys Arg Phe Asn Asn Arg Ile Leu Thr Lys Cys Lys Val Cys Gly

165 170 175

Lys Asn Thr Pro Leu Arg Arg Asn Val Arg Glu Leu Leu Leu Glu Asn

180 185 190

Ile Val Arg Phe Leu Pro Leu Glu Ser Glu Leu Lys Glu Thr Leu Lys

195 200 205

Arg Thr Ile Leu Glu Gly Gln Gln Gly Asn Ile Asn Lys Leu Phe Arg

210 215 220

Lys Leu Lys Phe Asn Gln Lys Asp Trp Pro Gly Lys Asn Leu Thr Asp

225 230 235 240

Ile Ala Lys Asn Lys Leu Pro Gly Arg Leu Pro Phe Cys Lys Glu His

245 250 255

Phe Ala Glu Asn Glu Lys Phe Thr Thr Ile Glu Lys Ser Thr Phe Arg
260 265 270
Leu Ala Pro Ser Leu Lys Thr Lys Ile Glu Asn Val Leu Thr Val Ile
275 280 285

Lys Asp Glu Val Met Pro Asn Phe Ala Leu Asp Arg Val Val Met Glu
290 295 300
Ser Asn Asn Phe Asp Ile Ala Ala Lys Thr Lys Gly Lys Lys Arg Leu
305 310 315 320
Ala Lys Glu Glu Tyr Ser Lys Gly His Lys Glu Asn Arg Glu Thr Leu
325 330 335
Met Glu Ser Leu Leu Arg Glu Thr Asp Gly Arg Cys Val Tyr Cys Gly
340 345 350

Lys Thr Ile Thr Leu Ala Asp Ala Asn Lys Asp His Ile Tyr Pro Lys
355 360 365
Lys Ala Gly Gly Ser Asn Ile Phe Ala Asn Leu Val Ala Cys Cys Arg
370 375 380
Ser Cys Asn Glu Asn Lys Gly Gly Arg Thr Pro Ser Glu Ser Gly Ile
385 390 395 400
Met Pro Asn Pro Glu Val Val Ala Thr Ile Lys Asn Asp Leu Lys Lys
405 410 415

Lys Ile Leu Asp Asp Ala Arg Ser Ile Lys Gln Leu Asp Phe Asn Lys
420 425 430
Tyr Met Ser His Ala Ser Ile Gly Trp Arg His Met Arg Asp Arg Leu
435 440 445
Lys Glu Leu Thr Gly Asn Asp Lys Leu Pro Val Glu Arg Leu Ser Gly
450 455 460
Ile Val Thr Ala Tyr Phe Arg Arg Trp Trp Gly Phe Lys Lys Glu Arg
465 470 475 480

Ala Asn Asp Lys His His Ala Leu Asp Ala Val Ile Leu Ala Ser Arg
485 490 495
Lys Asp Tyr Thr Asp Glu Gly Leu Val Ala Met Thr Leu Lys Pro Ala

500 505 510

Asn Ser Asp Gly Arg Glu Phe Asp Pro Glu Lys His Ile Lys Glu Ser

515 520 525

Glu Glu Phe Lys Arg Asn Lys Gly Ser Arg Gly Ser Ala Leu Tyr Asp

530 535 540

Lys Asn Pro Leu Ser Ile Lys Asn Gly Lys Ile Ala Arg Arg Tyr Met

545 550 555 560

Val Thr Glu Ile Glu Arg Gly Lys Glu Asp Ala Val Ile Ser Glu Glu

565 570 575

Trp Arg Glu Lys Leu Lys Glu Ala Phe Asp Arg Phe Gly Val Ser Asn

580 585 590

Gly Lys Cys Leu Thr Asp Leu Gln Thr Lys Glu Val Gly Leu Tyr Gly

595 600 605

Gln Lys Asn Pro Met Ser Leu Lys Cys Ala Val Arg Gly Ala Gly Lys

610 615 620

Gly Gln Ile Val Leu Ile Gly Asn Asn Ala Phe Lys Thr Asn Val His

625 630 635 640

Asn Val Gly Val Ala Val Tyr Leu Asp Glu Lys Gly Lys Lys Arg Ala

645 650 655

Cys Glu Leu Lys Asn Gln Arg Leu Ala Lys His Phe Val Glu Pro Gln

660 665 670

Asp Glu Ile Lys Gly Lys Ile Leu

675 680

<210> 488

<211> 330

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG34 effectors

<220><223> Description: MG34-24 effector

<400> 488

Asn Pro Glu Val Val Ala Thr Ile Lys Asn Asp Leu Lys Lys Lys Ile
1 5 10 15
Leu Asp Asp Ala Arg Ser Ile Lys Gln Leu Asp Phe Asn Lys Tyr Met
20 25 30

Ser His Ala Ser Ile Gly Trp Arg His Met Arg Asp Arg Leu Lys Glu
35 40 45
Leu Thr Gly Asn Asp Lys Leu Pro Val Glu Arg Leu Ser Gly Ile Val
50 55 60
Thr Ala Tyr Phe Arg Arg Trp Trp Gly Phe Lys Lys Glu Arg Ala Asn
65 70 75 80
Asp Lys His His Ala Leu Asp Ala Val Ile Leu Ala Ser Arg Lys Asp
85 90 95

Tyr Thr Asp Glu Gly Leu Val Ala Met Thr Leu Lys Pro Ala Asn Ser
100 105 110
Asp Gly Arg Glu Phe Asp Pro Glu Lys His Ile Lys Glu Ser Glu Glu
115 120 125
Phe Lys Arg Asn Lys Gly Ser Arg Gly Ser Ala Leu Tyr Asp Lys Asn
130 135 140
Pro Leu Ser Ile Lys Asn Gly Lys Ile Ala Arg Arg Tyr Met Val Thr
145 150 155 160

Glu Ile Glu Arg Gly Lys Glu Asp Ala Val Ile Ser Glu Glu Trp Arg
165 170 175
Glu Lys Leu Lys Glu Ala Phe Asp Arg Phe Gly Val Ser Asn Gly Lys
180 185 190
Cys Leu Thr Asp Leu Gln Thr Lys Glu Val Gly Leu Tyr Gly Gln Lys
195 200 205
Asn Pro Met Ser Leu Lys Cys Ala Val Arg Gly Ala Gly Lys Gly Gln
210 215 220

Ile Val Leu Ile Gly Asn Asn Ala Phe Lys Thr Asn Val His Asn Val
225 230 235 240
Gly Val Ala Val Tyr Leu Asp Glu Lys Gly Lys Lys Arg Ala Cys Glu

245 250 255

Leu Lys Asn Gln Arg Leu Ala Lys His Phe Val Glu Pro Gln Asp Glu

260 265 270

Ile Lys Gly Lys Ile Leu Phe Thr Leu Arg Lys Gly Asp Thr Val Lys

275 280 285

Ala Glu Asp Gly Asn Ile Tyr Arg Ile Leu Glu Leu Gly Glu Arg Pro

290 295 300

Val Val Asp Ile Lys Trp Val Pro Thr Ser Asp Gly Lys Lys Lys Arg

305 310 315 320

Val Lys Thr Ala Ile His Ala Thr Lys Leu

325 330

<210> 489

<211> 421

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223

> Description: MG35-422 effector

<400> 489

Met Val Tyr Val Leu Asn Met Asn Gly Gln Pro Leu Met Pro Cys Lys

1 5 10 15

Glu Ala Lys Ala Arg Lys Leu Leu Lys Asn His Cys Ala Lys Pro Val

20 25 30

Lys Lys Glu Pro Phe Thr Ile Gln Leu Leu Phe Asp Cys Glu Asn Gln

35 40 45

Val Gln Asn Ile Thr Leu Gly Ile Asp Ala Gly Ser Lys His Ile Gly

50 55 60

Leu Ser Ala Thr Thr Glu Gln Lys Glu Leu Tyr Ala Ala Asp Val Glu

65 70 75 80

Leu Arg Asn Asn Val Val Glu Leu Leu Ser Thr Arg Lys Gln Tyr Arg

85 90 95

Arg Ala Arg Arg Ser Lys Leu Arg Tyr Arg Ala Pro Arg Phe Tyr Asn
100 105 110
Arg Val His Ser Lys Asn Lys Gly Trp Leu Ala Pro Ser Ile Glu Gln
115 120 125

Lys Ile Ser Thr His Leu Arg Val Val Cys Asp Val Tyr Lys Ile Leu
130 135 140
Pro Val Ser Lys Ile Ile Val Glu Thr Ala Ser Phe Asp Ile Gln Arg
145 150 155 160
Ile Glu Asn Pro Asp Ile Ser Gly Lys Glu Tyr Gln Gln Gly Ser Gln
165 170 175
Leu Ser Phe Trp Asn Val Arg Glu Tyr Val Leu Trp Lys Asp Asn His
180 185 190

Glu Cys Gln Cys Cys His Gly Lys Ser Lys Asp Asn Ile Leu Asn Val
195 200 205
His His Ile Glu Ser Arg Lys Thr Gly Gly Asp Ser Pro Asn Asn Leu
210 215 220
Ile Thr Leu Cys Arg Tyr Cys His Asp Lys Tyr His Lys Gly Lys Ile
225 230 235 240
Glu Met Asp Leu Lys Arg Arg Leu Ser Leu Arg Asp Ala Ala Phe Met
245 250 255

Gly Thr Met Arg Trp Ser Phe Tyr His Arg Leu Lys Glu Lys Phe Pro
260 265 270
Asp Val Ser Met Thr Tyr Gly Tyr Ile Thr Lys Asn Thr Arg Ile Gln
275 280 285
Tyr Gly Leu Pro Lys Thr His Tyr Thr Asp Ala Arg Cys Ile Ser Gly
290 295 300
Asn Leu Leu Ala Glu Pro Leu Gly Tyr Tyr Phe Phe Gln Lys Lys Val
305 310 315 320

Arg Cys His Asn Arg Gln Ile His Lys Ile Asn Ile Gln Lys Gly Gly
325 330 335
Lys Arg Lys Arg Asn Gln Ala Lys Tyr Leu Val Lys Gly Phe Arg Leu

340 345 350

Phe Asp Lys Val Arg Tyr Lys Asn Gln Ile Gly Phe Val Leu Gly Arg

355 360 365

Arg Ala Ser Gly Tyr Phe Asp Ile Arg Thr Leu Asn Gly Glu Val Ile

370 375 380

His Arg Ser Ala Leu Tyr Lys Lys Leu Glu Leu Ile Asp Thr Arg Lys

385 390 395 400

Ala Leu Leu Thr Glu Arg Arg Gln Ala Val Leu Leu Met Ala Leu Asn

405 410 415

Val Ser Ile Pro Ala

420

<210> 490

<211> 415

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-423 effector

<400

> 490

Met Ser Asn Phe Val Phe Leu Ile Asp Ala Asn Lys Ser Pro Met Asn

1 5 10 15

Pro Ile His Pro Cys His Ala Arg Lys Leu Met Glu Ser Gly Lys Ala

20 25 30

Ala Ile Phe Arg Arg Tyr Pro Phe Thr Leu Ile Met Gly Arg Val Val

35 40 45

Glu Asn Ile Ile Thr Tyr Pro Leu Thr Leu Lys Ile Asp Pro Gly Ser

50 55 60

Lys Thr Thr Gly Ile Ser Leu Val Asn Asn Arg Asp Glu Val Ile Trp

65 70 75 80

Gly Met Glu Leu Gln His Arg Gly Leu Ala Ile Lys Asp Ser Leu Glu

85 90 95

Ser Arg Ser Ala Val Arg Gly Arg Arg Arg Ala Arg Asn Thr Arg Tyr
100 105 110
Arg Pro Ala Arg Phe Leu Asn Arg Thr Arg Pro Lys Gly Trp Leu Ala
115 120 125

Pro Ser Leu Leu His Arg Val Leu Thr Thr Glu Thr Trp Val Lys Arg
130 135 140
Leu Met Arg Phe Ala Pro Val Thr Asn Val Val Gln Glu Leu Val Arg
145 150 155 160
Phe Asp Leu Gln Gln Ile Glu Asn Pro Glu Ile Ser Gly Ile Glu Tyr
165 170 175
Gln Gln Gly Glu Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu Leu Asn
180 185 190

Lys Trp Asp Arg Lys Cys Ala Tyr Cys Ser Val Glu Asn Val Pro Val
195 200 205
Gln Ile Glu His Ile Gln Pro Lys Ser Lys Gly Gly Thr Asn Arg Ile
210 215 220
Ser Asn Leu Cys Leu Ala Cys Glu Lys Cys Asn Leu Lys Lys Gly Thr
225 230 235 240
Gln Asp Ile Gln Val Phe Leu Ala Lys Lys Pro Asp Leu Leu Lys Arg
245 250 255

Ile Leu Ala Gln Ala Arg Ser Pro Leu Lys Asp Ala Ala Ala Val Asn
260 265 270
Ser Thr Arg Trp Thr Leu Phe Asn Ala Leu Lys Glu Thr Gly Leu Pro
275 280 285
Val Thr Thr Gly Thr Gly Gly Gln Thr Lys Phe Asn Arg Asn Arg Leu
290 295 300
Gly Leu Pro Lys Ser His Trp Leu Asp Ala Ala Cys Val Gly Ile Val
305 310 315 320

Glu Thr Leu Lys Val Leu Ile Ser Asn Pro Leu Leu Val Lys Ala Thr
325 330 335
Gly Met Gly Thr Arg Arg Arg Cys Arg Met Asp Lys Phe Gly Phe Pro

340 345 350

Cys Cys Lys Pro Arg Lys Glu Tyr Leu His Gly Trp Lys Thr Gly Asp

355 360 365

Ile Ala Thr Ile Gly Cys Ile Thr Gly Arg Val Val Val Gln Ser Asp

370 375 380

Lys Arg Leu Glu Val Arg Leu Gly Lys Val Arg His Gly Gly Gln Leu

385 390 395 400

Ala Gln Phe Thr Lys Leu Phe Ser Lys Asp Gly Tyr Ser Tyr Ala

405 410 415

<210> 491

<211> 432

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-424 effector

<400> 491

Met Leu Thr Gly Leu Leu Ala Glu Gln Val Asp Pro Ala Gly Ile Arg

1 5 10 15

Lys Gly Asp Thr Leu Lys Val Phe Val Leu Asn Met Arg Gly Lys Pro

20 25 30

Leu Met Pro Cys Ser Pro Ala Lys Ala Arg His Met Leu Lys Ala Gly

35 40 45

Lys Ala Val Val Ala Arg Arg Thr Pro Phe Thr Val Lys Leu Thr Ile

50 55 60

Ala Thr Gly Glu Thr Lys Gln Asp Val Thr Leu Gly Val Asp Ala Gly

65 70 75 80

Ala Lys His Val Gly Ile Ser Ala Thr Thr Glu Lys Glu Glu Val Phe

85 90 95

Ala Ser Glu Val Glu Leu Arg Gln Asp Ile Thr Gly Leu Leu Ala Asp

100 105 110

Arg Leu Ala Phe Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg

115 120 125

Val Pro Arg Phe Asn Asn Arg Val Arg Ser Lys His Lys Gly Trp Leu

130 135 140

Ala Pro Ser Val Glu Asn Arg Ile Gln Ala His Ile Ser Arg Ile Glu

145 150 155 160

Ala Val Cys Arg Val Leu Pro Ile Thr Lys Ile Val Ile Glu Thr Ala

165 170 175

Ser Phe Asp Ile Gln Lys Ile Lys Asn Pro Glu Val Glu Gly Thr Asp

180 185 190

Tyr Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn Val Arg Glu Tyr Val

195 200 205

Leu Phe Arg Asp Val His Val Cys Gln His Cys Arg Gly Arg Ser Lys

210 215 220

Asp Pro Ile Leu Asn Val His His Leu Glu Ser Arg Lys Thr Gly Gly

225 230 235 240

Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu Thr Cys His Lys Ala

245 250 255

Tyr His Ala Gly Lys Ile Lys Leu Lys Thr Arg Arg Gly Thr Ser Phe

260 265 270

Arg Ala Glu Ala Phe Met Gly Ile Met Arg Arg Thr Leu Leu Asp Arg

275 280 285

Val Arg Lys Ala His Pro Glu Leu Ser Val Glu Asn Thr Tyr Gly Tyr

290 295 300

Leu Thr Lys His Lys Arg Ile Ala Leu Gly Leu Pro Lys Thr His Cys

305 310 315 320

Ala Asp Ala Phe Cys Ile Ala Gly Asn Leu Asn Ala Leu Arg Arg Gly

325 330 335

Asp Phe Leu Tyr Gln Arg Gln Thr Arg Lys His Asn Arg Gln Ile His

340 345 350

Lys Cys Ser Ile Leu Lys Gly Gly Val Arg Lys Leu His Gln Ala Pro

355 360 365

Phe Leu Val Lys Gly Phe Arg Leu Phe Asp Lys Val Lys Cys Thr Gly

370 375 380

Arg Ile Gly Ile Ile Phe Gly Arg Arg Ser Thr Gly Ser Phe Asp Val

385 390 395 400

Arg Thr Leu Asp Gly Thr Arg Leu Ser Ala Gly Ile Ser Ser Lys Lys

405 410 415

Leu Thr Leu Leu Glu Lys Arg Thr Thr Phe Leu Thr Gln Leu Arg Lys

420 425 430

<210> 492

<211> 432

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-425 effector

<400> 492

Met Leu Thr Gly Leu Leu Ala Glu Gln Val Asp Pro Ala Gly Ile Arg

1 5 10 15

Lys Gly Asp Thr Leu Lys Val Phe Val Leu Asn Met Arg Gly Lys Pro

20 25 30

Leu Met Pro Cys Ser Pro Ala Lys Ala Arg His Met Leu Lys Ala Gly

35 40 45

Lys Ala Val Val Ala Arg Arg Thr Pro Phe Thr Ile Lys Leu Thr Ile

50 55 60

Ala Thr Gly Glu Thr Lys Gln Asp Val Thr Leu Gly Val Asp Ala Gly

65 70 75 80

Ala Lys His Val Gly Ile Ser Ala Thr Thr Glu Lys Glu Glu Val Phe

85 90 95

Ala Ser Glu Val Glu Leu Arg Gln Asp Ile Thr Gly Leu Leu Ala Asp

100 105 110

Arg Leu Ala Phe Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg
115 120 125

Val Pro Arg Phe Asn Asn Arg Val Arg Ser Lys His Lys Gly Trp Leu
130 135 140
Ala Pro Ser Val Glu Asn Arg Ile Gln Ala His Ile Ser Arg Ile Glu
145 150 155 160
Ala Val Cys Arg Val Leu Pro Ile Thr Lys Ile Val Ile Glu Thr Ala
165 170 175
Ser Phe Asp Ile Gln Lys Ile Lys Asn Pro Glu Val Glu Gly Thr Asp
180 185 190

Tyr Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn Val Arg Glu Tyr Val
195 200 205
Leu Phe Arg Asp Gly His Val Cys Gln His Cys Arg Gly Arg Ser Lys
210 215 220
Asp Pro Ile Leu Asn Val His His Leu Glu Ser Arg Lys Thr Gly Gly
225 230 235 240
Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu Thr Cys His Lys Ala
245 250 255

Tyr His Ala Gly Lys Ile Lys Leu Lys Thr Arg Arg Gly Thr Ser Phe
260 265 270
Arg Ala Glu Ala Phe Met Gly Ile Met Arg Arg Thr Leu Leu Asp Arg
275 280 285
Val Arg Lys Ala His Pro Glu Leu Ser Val Glu Asn Thr Tyr Gly Tyr
290 295 300
Leu Thr Lys His Lys Arg Ile Ala Leu Gly Leu Pro Lys Thr His Cys
305 310 315 320

Ala Asp Ala Phe Cys Ile Ala Gly Asn Leu Asn Ala Leu Arg Arg Gly
325 330 335
Asp Phe Leu Tyr Gln Arg Gln Thr Arg Lys His Asn Arg Gln Ile His
340 345 350
Lys Cys Ser Ile Leu Lys Gly Gly Val Arg Lys Leu His Gln Ala Pro

355 360 365

Phe Leu Ala Lys Gly Phe Arg Leu Phe Asp Lys Val Lys Cys Thr Gly

370 375 380

Arg Ile Gly Ile Ile Phe Gly Arg Arg Ser Thr Gly Ser Phe Asp Val

385 390 395 400

Arg Thr Leu Asp Gly Thr Arg Leu Ser Ala Gly Ile Ser Ser Lys Lys

405 410 415

Leu Thr Leu Leu Glu Lys Arg Thr Thr Phe Leu Thr Gln Leu Arg Lys

420 425 430

<210> 493

<211> 389

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-426 effector

<400> 493

Met Leu Lys Ala Gly Lys Ala Val Val Ala Arg Arg Thr Pro Phe Thr

1 5 10 15

Ile Lys Leu Thr Ile Ala Thr Gly Glu Thr Lys Gln Asp Val Thr Leu

20 25 30

Gly Val Asp Ala Gly Ala Lys His Val Gly Ile Ser Ala Thr Thr Glu

35 40 45

Lys Glu Glu Val Phe Ala Ser Glu Val Glu Leu Arg Gln Asp Ile Thr

50 55 60

Gly Leu Leu Ala Asp His Leu Ala Phe Arg Arg Ser Arg Arg Asn Arg

65 70 75 80

Lys Thr Arg Tyr Arg Val Pro Arg Phe Asn Asn Arg Val Arg Ser Lys

85 90 95

His Lys Gly Trp Leu Ala Pro Ser Val Glu Asn Arg Ile Gln Ala His

100 105 110

Ile Ser Arg Ile Glu Ala Val Cys Arg Val Leu Pro Ile Thr Lys Ile

115 120 125

Val Ile Glu Thr Ala Ser Phe Asp Ile Gln Lys Ile Lys Asn Pro Glu

130 135 140

Val Glu Gly Thr Asp Tyr Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn

145 150 155 160

Val Arg Glu Tyr Val Leu Phe Arg Asp Gly His Val Cys Gln His Cys

165 170 175

Arg Gly Arg Ser Lys Asp Pro Ile Leu Asn Val His His Leu Glu Ser

180 185 190

Arg Lys Thr Gly Gly Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu

195 200 205

Thr Cys His Lys Ala Tyr His Ala Gly Lys Ile Lys Leu Lys Thr Arg

210 215 220

Arg Gly Thr Ser Phe Arg Ala Glu Ala Phe Met Gly Ile Met Arg Arg

225 230 235 240

Thr Leu Leu Asp Arg Val Arg Lys Ala His Pro Glu Leu Ser Val Glu

245 250 255

Asn Thr Tyr Gly Tyr Leu Thr Lys His Lys Arg Ile Ala Leu Gly Leu

260 265 270

Pro Lys Thr His Cys Ala Asp Ala Phe Cys Ile Ala Gly Asn Leu Asn

275 280 285

Ala Leu Arg Arg Gly Asp Phe Leu Tyr Gln Arg Gln Thr Arg Lys His

290 295 300

Asn Arg Gln Ile His Lys Cys Ser Ile Leu Lys Gly Gly Val Arg Lys

305 310 315 320

Leu His Gln Ala Pro Phe Leu Val Lys Gly Phe Arg Leu Phe Asp Lys

325 330 335

Val Lys Cys Thr Gly Arg Ile Gly Ile Ile Phe Gly Arg Arg Ser Thr

340 345 350

Gly Ser Phe Asp Val Arg Thr Leu Asp Gly Thr Arg Leu Ser Ala Gly

355 360 365

Ile Ser Ser Lys Lys Leu Thr Leu Leu Glu Lys Arg Thr Thr Phe Leu

370 375 380

Thr Gln Leu Arg Lys

385

<210> 494

<211> 445

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-427 effector

<400> 494

Val Leu His Thr Ala Asn Leu Pro Leu Thr Leu Ala Lys Val Ser Leu

1 5 10 15

Arg Gln Val Trp Pro Ala Tyr Arg Arg Lys Gly Thr Tyr Ile Met Val

20 25 30

Tyr Val Val Ala Asn Asp Gly Gln Pro Leu Met Pro Thr Glu Arg His

35 40 45

Gly Lys Val Cys Arg Met Leu Arg Ser Gly Met Ala Lys Val Ile Lys

50 55 60

Lys Cys Pro Phe Thr Ile Gln Leu Gln Tyr Glu Ser Glu Arg Asn Val

65 70 75 80

Gln Pro Val Ser Leu Gly Val Asp Ala Gly Ser Lys His Ile Gly Ile

85 90 95

Ser Ala Thr Thr Lys Ala Lys Val Leu Tyr Glu Ser Asp Val Glu Leu

100 105 110

Arg Asp Asp Ile Val Lys Leu Leu Ala Thr Arg Arg Gln Leu Arg Arg

115 120 125

Ser Arg Arg Ser Arg Lys Thr Arg Tyr Arg Pro Ala Arg Phe Asp Asn

130 135 140

Arg Lys Arg Lys Glu Gly Trp Leu Ala Pro Ser Ile Arg Gln Lys Ile

145 150 155 160

Gly Ser His Leu Thr Val Val Ala Asn Val Cys Lys Ile Leu Pro Ile

165 170 175

Asn Gln Ile Ile Val Glu Thr Ala Ser Phe Asp Ile Gln Lys Ile Lys

180 185 190

Asn Pro Glu Ile Gln Gly Ile Glu Tyr Gln Gln Gly Glu Gln Met Asp

195 200 205

Phe Trp Asn Val Arg Glu Tyr Val Phe Phe Arg Asp Gly His Thr Cys

210 215 220

Gln Cys Cys Lys Gly Arg Ser Lys Asp Lys Ile Leu Asn Val His His

225 230 235 240

Ile Glu Ser Arg Lys Thr Gly Gly Asn Ala Pro Asn Asn Leu Ile Thr

245 250 255

Leu Cys Glu Thr Cys His Lys Gly Tyr His Asn Gly Thr Val Ile Leu

260 265 270

Pro Lys Asn Ile Lys Arg Gly Met Gln Phe Lys Asp Ala Ala Phe Met

275 280 285

Gly Ile Met Arg Trp Ala Phe Tyr Asn Ala Leu Lys Glu Gln Tyr Glu

290 295 300

Pro Ala Val Pro Val Ser Met Thr Tyr Gly Tyr Leu Thr Lys Asn Thr

305 310 315 320

Arg Ile Glu His Gly Leu Leu Lys Glu His Tyr Ile Asp Ala Arg Cys

325 330 335

Ile Ser Gly Asn Pro Asp Ala Val Ser Asp Gly Thr Tyr Tyr Tyr Gln

340 345 350

Lys Lys Val Arg Cys His Asn Arg Gln Ile His Lys Gln Thr Ile Leu

355 360 365

Lys Gly Gly Ile Arg Lys Ser Asn Gln Ala Glu Tyr Leu Val Lys Gly

370 375 380

Tyr Arg Leu Phe Asp Lys Val Arg Tyr Gln Gly Arg Glu Tyr Phe Ile

385 390 395 400

Phe Gly Arg Arg Lys Thr Gly Phe Phe Asp Ile Arg Thr Leu Ser Gly

405 410 415

Glu Lys Val Asn Lys Gly Ser Ile Ser Val Lys Lys Leu Thr Phe Ala

420 425 430

Asp Thr Arg Lys Asn Tyr Leu Thr Glu Arg Arg Thr Ala

435 440 445

<210> 495

<211> 432

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-428 effector

<400

> 495

Met Leu Thr Gly Leu Leu Ala Glu Gln Val Asp Pro Ala Gly Ile Arg

1 5 10 15

Lys Gly Asp Thr Leu Lys Val Phe Val Leu Asn Met Arg Gly Lys Pro

20 25 30

Leu Met Pro Cys Ser Pro Ala Lys Ala Arg His Met Leu Lys Ala Gly

35 40 45

Lys Ala Val Val Ala Arg Arg Thr Pro Phe Thr Ile Lys Leu Thr Ile

50 55 60

Ala Thr Gly Glu Thr Lys Gln Asp Val Thr Leu Gly Val Asp Ala Gly

65 70 75 80

Ala Lys His Val Gly Ile Ser Ala Thr Thr Glu Lys Glu Glu Val Phe

85 90 95

Ala Ser Glu Val Glu Leu Arg Gln Asp Ile Thr Gly Leu Leu Ala Asp

100 105 110

Arg Leu Ala Phe Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg

115 120 125

Ala Pro Arg Phe Asp Asn Arg Val Arg Ser Lys His Lys Gly Trp Leu
130 135 140
Ala Pro Ser Val Glu Asn Arg Ile Gln Ala His Ile Ser Arg Ile Glu
145 150 155 160
Ala Val Cys Arg Val Leu Pro Ile Thr Lys Ile Val Ile Glu Thr Ala
165 170 175
Ser Phe Asp Ile Gln Lys Ile Lys Asn Pro Glu Val Glu Gly Thr Asp
180 185 190

Tyr Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn Val Arg Glu Tyr Val
195 200 205
Leu Phe Arg Asp Gly His Val Cys Gln His Cys Arg Gly Arg Ser Lys
210 215 220
Asp Pro Ile Leu Asn Val His His Leu Glu Ser Arg Lys Thr Gly Gly
225 230 235 240
Asp Ala Pro Asn Asn Leu Asn Thr Leu Cys Glu Thr Cys His Lys Ala
245 250 255

Tyr His Ala Gly Lys Ile Lys Leu Lys Ala Arg Arg Gly Thr Ser Phe
260 265 270
Arg Ala Glu Ala Phe Met Gly Ile Met Arg Arg Thr Leu Leu Asp Arg
275 280 285
Val Arg Lys Ala His Pro Glu Leu Ser Val Glu Asn Thr Tyr Gly Tyr
290 295 300
Leu Thr Lys His Lys Arg Ile Ala Leu Gly Leu Pro Lys Thr His Cys
305 310 315 320

Ala Asp Ala Phe Cys Ile Ala Gly Asn Leu Asn Ala Leu Arg Arg Gly
325 330 335
Asp Phe Leu Tyr Gln Arg Gln Thr Arg Lys His Asn Arg Gln Ile His
340 345 350
Lys Cys Ser Ile Leu Lys Gly Gly Val Arg Lys Leu His Gln Ala Pro
355 360 365

Phe Leu Val Lys Gly Phe Arg Leu Phe Asp Lys Val Lys Cys Thr Gly
370 375 380

Arg Ile Gly Ile Ile Phe Gly Arg Arg Ser Thr Gly Ser Phe Asp Val
385 390 395 400
Arg Thr Leu Asp Gly Thr Arg Leu Ser Ala Gly Ile Ser Ser Lys Lys
405 410 415
Leu Thr Leu Leu Glu Lys Arg Thr Thr Phe Leu Thr Gln Leu Arg Lys
420 425 430

<210> 496
<211> 389
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors
<220><223> Description: MG35-429 effector
<400> 496
Met Leu Lys Ala Gly Lys Ala Val Val Ala Arg Arg Thr Pro Phe Thr
1 5 10 15
Ile Lys Leu Thr Ile Ala Thr Gly Glu Thr Lys Gln Asp Val Thr Leu
20 25 30
Gly Val Asp Ala Gly Ala Lys His Val Gly Ile Ser Ala Thr Thr Glu
35 40 45
Lys Glu Glu Val Phe Ala Ser Glu Val Glu Leu Arg Gln Asp Ile Thr

50 55 60
Gly Leu Leu Ala Asp Arg Leu Ala Phe Arg Arg Ser Arg Arg Asn Arg
65 70 75 80
Lys Thr Arg Tyr Arg Ala Pro Arg Phe Asn Asn Arg Val Arg Ser Lys
85 90 95
His Lys Gly Trp Leu Ala Pro Ser Val Glu Asn Arg Ile Gln Ala His
100 105 110

Ile Ser Arg Ile Glu Ala Ile Cys Arg Val Leu Pro Ile Thr Lys Ile

115 120 125

Val Ile Glu Thr Ala Ser Phe Asp Ile Gln Lys Ile Lys Asn Pro Glu

130 135 140

Val Glu Gly Thr Asp Tyr Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn

145 150 155 160

Val Arg Glu Tyr Val Leu Phe Arg Asp Gly His Val Cys Gln His Cys

165 170 175

Arg Gly Arg Ser Lys Asp Pro Ile Leu Asn Val His His Leu Glu Ser

180 185 190

Arg Lys Thr Gly Gly Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu

195 200 205

Thr Cys His Lys Ala Tyr His Ala Gly Lys Ile Lys Leu Lys Thr Arg

210 215 220

Arg Gly Thr Ser Phe Arg Ala Glu Ala Phe Met Gly Ile Met Arg Arg

225 230 235 240

Thr Leu Leu Asp Arg Val Arg Lys Ala His Pro Glu Leu Ser Val Glu

245 250 255

Asn Thr Tyr Gly Tyr Leu Thr Lys His Lys Arg Ile Ala Leu Gly Leu

260 265 270

Pro Lys Thr His Cys Ala Asp Ala Phe Cys Ile Ala Gly Asn Leu Asn

275 280 285

Ala Leu Arg Arg Gly Asp Phe Leu Tyr Gln Arg Gln Thr Arg Lys His

290 295 300

Asn Arg Gln Ile His Lys Cys Ser Ile Leu Lys Gly Gly Val Arg Lys

305 310 315 320

Leu His Gln Ala Pro Phe Leu Val Lys Gly Phe Arg Leu Phe Asp Lys

325 330 335

Val Lys Cys Thr Gly Arg Ile Gly Ile Ile Phe Gly Arg Arg Ser Thr

340 345 350

Gly Ser Phe Asp Val Arg Thr Leu Asp Gly Thr Arg Leu Ser Ala Gly

355 360 365

Ile Ser Ser Lys Lys Leu Thr Leu Leu Glu Lys Arg Thr Thr Phe Leu

370 375 380

Thr Gln Leu Arg Lys

385

<210> 497

<211> 422

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-430 effector

<400> 497

Met Gln Glu Val Leu Lys Thr Val Val Tyr Val Ile Asn Ile Asp Glu

1 5 10 15

Lys Pro Leu Met Pro Cys Lys Glu Ala Lys Ala Arg Lys Leu Leu Lys

20 25 30

Gln Asp Lys Ala Lys Ile Tyr Lys Arg Glu Pro Phe Thr Ile Gln Leu

35 40 45

Leu Phe Glu Cys Glu Asn Lys Thr Gln Asp Ile Thr Phe Gly Val Asp

50 55 60

Ala Gly Ser Lys His Ile Gly Leu Ser Ala Thr Thr Asp Lys Arg Glu

65 70 75 80

Leu Tyr Ala Ala Asp Ile Glu Leu Arg Arg Asp Ile Val Asp Leu Leu

85 90 95

Ser Thr Arg Arg Ala Asn Arg Arg Ala Arg Arg Asn Arg Leu Arg Tyr

100 105 110

Arg Ala Pro Arg Phe Asn Asn Arg Val His Ser Lys His Lys Gly Trp

115 120 125

Leu Ala Pro Ser Ile Glu Gln Lys Ile Gln Cys His Phe Gln Val Ile

130 135 140

Lys Asn Val His Asp Ile Leu Pro Ile Thr Lys Ile Val Val Glu Val

145 150 155 160

Ala Ser Phe Asp Ile Gln Lys Ile Lys Asn Pro Asn Ile Ser Gly Asp

165 170 175

Asp Tyr Gln Lys Gly Asp Gln Leu Gly Phe Trp Asn Ile Arg Glu Tyr

180 185 190

Val Leu Phe Arg Asp Asn His Ile Cys Gln Cys Cys Lys Gly Lys Ser

195 200 205

Lys Asp Ser Ile Leu Asn Val His His Ile Glu Ser Arg Lys Thr Gly

210 215 220

Gly Asn Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu Thr Cys His Ala

225 230 235 240

Gly Tyr His Asn Gly Asn Val Lys Leu Pro Lys Asn Ile Lys Arg Gly

245 250 255

Met Ser Phe Arg Asp Ala Thr Phe Met Gly Val Met Arg Trp Ala Phe

260 265 270

Phe Asn Arg Leu Lys Ala Thr Tyr Pro Asn Val Ser Met Thr Phe Gly

275 280 285

Tyr Ile Thr Lys Asn Thr Arg Ile Gln Asn Gly Leu Pro Lys Glu His

290 295 300

Tyr Val Asp Ala Arg Cys Ile Ser Gly Asn Pro Ala Val Glu Pro Leu

305 310 315 320

Gly Tyr Tyr Tyr Tyr Gln Lys Lys Val Arg Cys His Asn Arg Gln Ile

325 330 335

Tyr Lys Ala Asn Thr Leu Lys Gly Gly Lys Lys Arg Leu Asn Gln Ala

340 345 350

Pro Tyr Asn Val Lys Gly Phe Arg Leu Phe Asp Lys Val Lys Tyr Asn

355 360 365

Asn Lys Ile Cys Phe Ile Phe Gly Arg Arg Ser Ser Gly Tyr Phe Asp

370 375 380

Leu Arg Lys Leu Asp Gly Thr Lys Val Ser Ala Ser Ala Ser Tyr Lys

385 390 395 400

Lys Ile Leu Leu Thr Gln Ile Arg Lys Asn Tyr Ile Ser Glu Arg Lys

405 410 415

Glu Met Thr Lys Ile Leu

420

<210> 498

<211> 415

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-431 effector

<400> 498

Met Val Tyr Val Val Ala Asn Asp Gly Gln Pro Leu Met Pro Thr Glu

1 5 10 15

Arg His Gly Lys Val Cys Arg Met Leu Lys Ser Gly Met Ala Lys Val

20 25 30

Val Lys Lys Cys Pro Phe Thr Ile Gln Leu Gln Tyr Glu Ser Glu Arg

35 40 45

Asn Val Gln Pro Val Ser Leu Gly Val Asp Ala Gly Ser Lys His Ile

50 55 60

Gly Ile Ser Ala Thr Thr Lys Thr Lys Val Leu Tyr Glu Ser Asp Val

65 70 75 80

Glu Leu Arg Asp Asp Ile Val Lys Leu Leu Ala Thr Arg Arg Gln Leu

85 90 95

Arg Leu Ser Arg Arg Ser Arg Lys Thr Arg Tyr Arg Pro Val Arg Phe

100 105 110

Asp Asn Arg Lys Arg Lys Glu Gly Trp Leu Ala Pro Ser Ile Arg Gln

115 120 125

Lys Ile Gly Ser His Leu Thr Val Val Ala Asn Val Cys Lys Ile Leu

130 135 140

Pro Ile Asn Gln Ile Ile Val Glu Thr Ala Ser Phe Asp Ile Gln Lys

145 150 155 160

Ile Lys Asp Pro Glu Ile Gln Gly Ile Glu Tyr Gln Gln Gly Glu Gln

165 170 175

Met Asp Phe Trp Asn Ile Arg Glu Tyr Val Leu Phe Trp Asp Gly His

180 185 190

Thr Cys Gln Cys Cys Lys Gly Arg Ser Lys Asp Lys Ile Leu Asn Val

195 200 205

His His Ile Glu Ser Arg Lys Thr Gly Gly Asn Ala Pro Asn Asn Leu

210 215 220

Ile Thr Leu Cys Glu Thr Cys His Lys Gly Tyr His Asn Gly Thr Val

225 230 235 240

Ile Leu Pro Lys Asn Ile Lys His Gly Met Gln Phe Lys Asp Ala Ala

245 250 255

Phe Met Gly Ile Met Arg Trp Thr Phe Tyr Asn Thr Leu Lys Glu Gln

260 265 270

Tyr Glu Pro Asp Ile Pro Val Ser Met Thr Tyr Gly Tyr Leu Thr Lys

275 280 285

Asn Thr Arg Ile Glu His Gly Leu Pro Lys Glu His Tyr Ile Asp Ala

290 295 300

Arg Cys Ile Ser Gly Asn Pro Asp Ala Val Ser Asp Gly Thr Tyr Tyr

305 310 315 320

Tyr Gln Lys Lys Val Arg Cys His Asn Arg Gln Ile His Lys Gln Thr

325 330 335

Ile Leu Lys Asp Gly Val Arg Lys Ser Asn Gln Ala Glu Tyr Leu Val

340 345 350

Lys Gly Tyr Arg Leu Phe Asp Lys Val Arg Tyr Gln Gly Arg Glu Tyr

355 360 365

Phe Ile Phe Gly Arg Arg Lys Ser Gly Phe Phe Asp Ile Arg Thr Leu

370 375 380

Ser Gly Glu Lys Val Asn Lys Gly Ser Ile Ser Val Lys Lys Leu Thr

385 390 395 400

Phe Ala Asp Thr Arg Lys Asn Tyr Leu Thr Glu Arg Arg Thr Val

405 410 415

<210> 499

<211> 406

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-432 effector

<400> 499

Met Arg Gly Lys Pro Leu Met Pro Cys Ser Pro Ala Lys Ala Arg His

1 5 10 15

Met Leu Lys Ala Gly Lys Ala Val Val Val Arg Arg Thr Pro Phe Thr

20 25 30

Ile Lys Leu Thr Ile Ala Thr Gly Glu Thr Lys Gln Asp Val Thr Leu

35 40 45

Gly Val Asp Ala Gly Ala Arg His Val Gly Ile Ser Ala Thr Thr Glu

50 55 60

Lys Glu Glu Val Phe Ala Ser Glu Val Ala Leu Arg Gln Asp Ile Thr

65 70 75 80

Gly Leu Leu Ala Asp Arg Leu Ala Phe Arg Arg Ala Arg Arg Asn Arg

85 90 95

Lys Thr Arg Tyr Arg Ala Pro Arg Phe Asn Asn Arg Val Arg Ser Lys

100 105 110

His Lys Gly Trp Leu Ala Pro Ser Val Glu Asn Arg Ile Gln Ala His

115 120 125

Met Ser Arg Ile Asp Ala Val Cys Arg Leu Leu Pro Val Thr Lys Ile

130 135 140

Val Ile Glu Thr Ala Ser Phe Asp Val Gln Lys Ile Lys Asn Pro Thr

145 150 155 160

Ile Glu Gly Thr Asp Tyr Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn
165 170 175
Val Arg Glu Tyr Val Leu Phe Arg Asp Gly His Ile Cys Gln His Cys
180 185 190
Arg Gly Arg Ser Lys Asp Pro Ile Leu Asn Val His His Leu Glu Ser
195 200 205
Arg Lys Thr Gly Gly Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu
210 215 220

Thr Cys His Lys Ala Tyr His Ala Gly Lys Ile Lys Leu Lys Val Lys
225 230 235 240
Arg Gly Gln Ser Phe Arg Ala Glu Ala Phe Met Gly Ile Met Arg Trp
245 250 255
Thr Leu Leu Asp Arg Val Arg Lys Thr His Pro Lys Leu Pro Val Glu
260 265 270
Asn Thr Tyr Gly Tyr Leu Thr Lys His Lys Arg Ile Ala Leu Gly Leu
275 280 285

Pro Lys Thr His Cys Ala Asp Ala Phe Cys Ile Ala Gly Asn Leu Lys
290 295 300
Ala Leu Arg Arg Gly Asp Phe Leu Phe Gln Gln Gln Thr Arg Lys His
305 310 315 320
Asn Arg Gln Ile His Lys Cys Ser Ile Leu Lys Gly Gly Val Arg Lys
325 330 335
Leu Asn Gln Ala Pro Phe Leu Val Lys Gly Phe Arg Leu Phe Asp Lys
340 345 350

Val Arg Ile Gly Gly Gln Ile Gly Phe Val Phe Gly Arg Arg Val Arg
355 360 365
Gly Leu Phe Asn Ile Arg Arg Leu Asp Lys Thr Val Ile Gly Thr Asp
370 375 380
Ile Asn Cys Lys Lys Leu Ser Leu Leu Glu Thr Arg Lys Thr Phe Leu
385 390 395 400

Thr Glu Leu Arg Lys Glu
405

<210> 500

<211> 389

<212> PRT

<213> Unknown

<220><223>

Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-433 effector

<400> 500

Met Leu Lys Ala Gly Lys Ala Val Val Ala Arg Arg Thr Pro Phe Thr
1 5 10 15

Ile Lys Leu Thr Ile Ala Thr Gly Glu Thr Lys Gln Asp Val Thr Leu
20 25 30

Gly Val Asp Ala Gly Ala Lys His Val Gly Ile Ser Ala Thr Thr Glu
35 40 45

Lys Glu Glu Val Phe Ala Ser Glu Val Glu Leu Arg Gln Asp Ile Thr
50 55 60

Gly Leu Leu Ala Asp Arg Leu Ala Phe Arg Arg Ser Arg Arg Asn Arg
65 70 75 80

Lys Thr Arg Tyr Arg Val Pro Arg Phe Asn Asn Arg Val Arg Ser Lys
85 90 95

His Lys Gly Trp Leu Ala Pro Ser Val Glu Asn Arg Ile Gln Ala His
100 105 110

Ile Ser Arg Ile Glu Ala Val Cys Arg Val Leu Pro Ile Thr Lys Ile
115 120 125

Val Ile Glu Thr Ala Ser Phe Asp Ile Gln Lys Ile Lys Asn Pro Glu
130 135 140

Val Glu Gly Thr Asp Tyr Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn
145 150 155 160

Val Arg Glu Tyr Val Leu Phe Arg Asp Gly His Val Cys Gln His Cys

165 170 175

Arg Gly Arg Ser Lys Asp Pro Ile Leu Asn Val His His Leu Glu Ser
180 185 190
Arg Lys Thr Gly Gly Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu
195 200 205
Thr Cys His Lys Ala Tyr His Ala Gly Lys Ile Lys Leu Lys Thr Arg
210 215 220
Arg Gly Thr Ser Phe Arg Ala Glu Ala Phe Met Gly Ile Met Arg Arg
225 230 235 240

Thr Leu Leu Asp Arg Val Arg Lys Ala His Pro Glu Leu Ser Val Glu
245 250 255
Asn Thr Tyr Gly Tyr Leu Thr Lys His Lys Arg Ile Ala Leu Gly Leu
260 265 270
Pro Lys Thr His Cys Ala Asp Ala Phe Cys Ile Ala Gly Asn Leu Asn
275 280 285
Ala Leu Arg Arg Gly Asp Phe Leu Tyr Gln Arg Gln Thr Arg Lys His
290 295 300

Asn Arg Gln Ile His Lys Cys Ser Ile Leu Lys Gly Gly Val Arg Lys
305 310 315 320
Leu His Gln Ala Pro Phe Leu Val Lys Gly Phe Arg Leu Phe Asp Lys
325 330 335
Val Lys Cys Thr Gly Arg Ile Gly Ile Ile Phe Gly Arg Arg Ser Thr
340 345 350
Gly Ser Phe Asp Val Arg Thr Leu Asp Gly Thr Arg Leu Ser Ala Gly
355 360 365

Ile Ser Ser Lys Lys Leu Thr Leu Leu Glu Lys Arg Thr Thr Phe Leu
370 375 380
Thr Gln Leu Arg Lys
385
<210> 501
<211> 406

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-434 effector

<400> 501

Met Arg Gly Lys Pro Leu Met Pro Cys Ser Pro Ala Lys Ala Arg His
1 5 10 15

Met Leu Lys Ala Gly Lys Ala Phe Val Val Arg Arg Thr Pro Phe Thr
20 25 30

Ile Lys Leu Thr Ile Ala Thr Gly Glu Thr Lys Gln Asp Val Thr Leu
35 40 45

Gly Val Asp Ala Gly Ala Arg His Val Gly Ile Ser Ala Thr Thr Glu
50 55 60

Lys Glu Glu Val Phe Ala Ser Glu Val Lys Leu Arg Gln Asp Ile Thr
65 70 75 80

Gly Leu Leu Ala Asp Arg Leu Ala Phe Arg Arg Ala Arg Arg Asn Arg
85 90 95

Lys Thr Arg Tyr Arg Ser Pro Arg Phe Asn Asn Arg Val Arg Ser Lys
100 105 110

His Lys Gly Trp Leu Ala Ser Ser Val Glu Asn Arg Ile Gln Ala His
115 120 125

Met Ser Arg Ile Asp Ala Val Cys Arg Leu Leu Pro Val Thr Lys Ile
130 135 140

Val Ile Glu Ala Ala Ser Phe Asp Val Gln Lys Ile Lys Asn Pro Thr
145 150 155 160

Ile Glu Gly Thr Asp Tyr Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn
165 170 175

Val Arg Glu Tyr Val Leu Phe Arg Asp Gly His Val Cys Gln His Cys
180 185 190

His Gly Arg Ser Arg Asp Lys Ile Leu Asn Val His His Leu Glu Ser

195 200 205

Arg Lys Thr Gly Gly Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu
210 215 220
Thr Cys His Lys Ala Tyr His Ala Gly Lys Ile Lys Leu Lys Val Lys
225 230 235 240
Arg Gly Gln Ser Phe Arg Ala Glu Ala Phe Met Gly Ile Met Arg Trp
245 250 255
Thr Leu Leu Asp Arg Val Arg Lys Thr His Pro Lys Leu Pro Val Glu
260 265 270

Asn Thr Tyr Gly Tyr Leu Thr Lys His Lys Arg Ile Ala Leu Gly Leu
275 280 285
Pro Lys Thr His Cys Ala Asp Ala Phe Cys Ile Ala Gly Asn Leu Lys
290 295 300
Ala Leu Arg Arg Gly Asp Phe Leu Phe Gln Gln Gln Thr Arg Lys His
305 310 315 320
Asn Arg Gln Ile His Arg Cys Ser Ile Leu Lys Gly Gly Val Arg Lys
325 330 335

Leu Asn Gln Ala Pro Phe Leu Val Lys Gly Phe Arg Leu Phe Asp Lys
340 345 350
Val Arg Ile Gly Gly Gln Ile Gly Phe Val Phe Gly Arg Arg Val Arg
355 360 365
Gly Ile Phe Asn Ile Arg Arg Leu Asp Lys Thr Val Ile Gly Lys Asp
370 375 380
Ile Asn Cys Lys Lys Leu Ser Leu Leu Glu Thr Arg Lys Thr Phe Leu
385 390 395 400

Ile Glu Leu Arg Lys Glu
405

<210> 502
<211> 416
<212> PRT
<213> Unknown

<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-435 effector
<400> 502

Val Ile Tyr Val Leu Asn Ile Glu Gly Gln Pro Leu Met Pro Cys Lys
1 5 10 15
Glu Ala Lys Ala Arg Lys Leu Leu Lys Gln Asn Lys Ala Lys Ile Tyr
20 25 30

Lys Arg Glu Pro Phe Thr Ile Gln Leu Leu Phe Val Cys Glu Asn Gln
35 40 45
Thr Gln Asp Ile Thr Leu Gly Val Asp Ala Gly Ser Lys His Ile Gly
50 55 60
Leu Ser Ala Thr Thr Lys Glu Lys Glu Leu Tyr Ala Ala Asp Val Glu
65 70 75 80
Leu Arg Asn Asp Ile Val Glu Leu Leu Ala Ile Arg Arg Gln Asn Arg
85 90 95

Arg Ala Arg Arg Asn Arg Leu Arg Tyr Arg Lys Pro Arg Phe Asn Asn
100 105 110
Arg Val Tyr Ser Lys Lys Ser Gly Trp Leu Ala Pro Ser Val Glu Gln
115 120 125
Lys Ile Arg Thr His Phe Arg Val Ile Glu Asp Ile His Lys Leu Leu
130 135 140
Pro Ile Thr Lys Ile Val Val Glu Thr Ala Ser Phe Asp Ile Gln Lys
145 150 155 160

Ile Lys Asn Pro Glu Ile His Asn Glu Glu Tyr Gln Gln Gly Glu Gln
165 170 175
Leu Gly Phe Trp Asn Val Arg Glu Tyr Val Leu Phe Arg Asp Asn His
180 185 190
Thr Cys Gln Cys Cys Lys Gly Lys Ser Lys Asp Lys Ile Leu Asn Val
195 200 205
His His Ile Glu Ser Lys Lys Thr Gly Gly Asn Ala Pro Asn Asn Leu

210 215 220

Ile Thr Leu Cys Glu Thr Cys His Lys Gly Tyr His Asn Gly Thr Val
225 230 235 240
Lys Leu Leu Lys Thr Ile Lys Arg Gly Met Ser Phe Lys Asp Ala Ala
245 250 255
Phe Met Gly Ile Met Arg Trp Ser Phe Tyr Asp Arg Leu Lys Glu Ala
260 265 270
Tyr Pro Asn Val Phe Met Thr Tyr Gly Tyr Ile Thr Lys Asn Thr Arg
275 280 285

Val Lys Cys Asn Leu Pro Lys Glu His Tyr Ile Asp Ala Arg Cys Ile
290 295 300
Ser Gly Asn Pro Asn Val Glu Pro Leu Gly Tyr Tyr Phe Tyr Gln Lys
305 310 315 320
Lys Val Arg Cys His Asn Arg Gln Ile His Lys Ala Lys Ile Leu Lys
325 330 335
Gly Gly Lys Lys Lys Met Asn Gln Ala Ser Tyr Leu Val Lys Gly Phe
340 345 350

Arg Leu Phe Asp Lys Val Glu Phe Asp Gly Gln Val Gly Phe Ile Phe
355 360 365
Gly Arg Arg Asn Ser Gly Tyr Phe Asp Val Arg Lys Leu Asn Lys Glu
370 375 380
Val Ile Ser Arg Ser Ala Ser Tyr Lys Lys Leu Thr Phe Leu Glu Thr
385 390 395 400
Arg Lys Ser Leu Leu Ile Glu Lys Arg Ile Gln Gly Val Gly Ile Ile
405 410 415

<210> 503
<211> 432
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-436 effector

<400> 503

Met Leu Thr Gly Leu Leu Ala Glu Gln Val Asp Pro Ala Gly Ile Arg
1 5 10 15

Lys Gly Asp Thr Leu Lys Val Phe Val Leu Asn Met Arg Gly Lys Pro
20 25 30

Leu Met Pro Cys Ser Pro Ala Lys Ala Arg His Met Leu Lys Ala Gly
35 40 45

Lys Ala Val Val Ala Arg Arg Thr Pro Phe Thr Ile Lys Leu Thr Ile
50 55 60

Ala Thr Gly Glu Thr Lys Gln Asp Val Thr Leu Gly Val Asp Ala Gly
65 70 75 80

Ala Lys His Val Gly Ile Ser Ala Thr Thr Glu Lys Glu Glu Val Phe
85 90 95

Ala Ser Glu Val Glu Leu Arg Gln Asp Ile Thr Gly Leu Leu Ala Asp
100 105 110

Arg Leu Ala Phe Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg
115 120 125

Ala Pro Arg Phe Asn Asn Arg Val Arg Ser Lys His Lys Gly Trp Leu
130 135 140

Ala Pro Ser Val Glu Asn Arg Ile Gln Ala His Ile Ser Arg Ile Glu
145 150 155 160

Ala Ile Cys Arg Val Leu Pro Ile Thr Lys Ile Val Ile Glu Thr Ala
165 170 175

Ser Phe Asp Ile Gln Lys Ile Lys Asn Pro Glu Val Glu Gly Thr Asp
180 185 190

Tyr Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn Val Arg Glu Tyr Val
195 200 205

Leu Phe Arg Asp Gly His Val Cys Gln His Cys Arg Gly Arg Ser Lys
210 215 220

Asp Pro Ile Leu Asn Val His His Leu Glu Ser Arg Lys Thr Gly Gly

225 230 235 240

Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu Thr Cys His Lys Ala

245 250 255

Tyr His Ala Gly Lys Ile Lys Leu Lys Thr Arg Arg Gly Thr Ser Phe

260 265 270

Arg Ala Glu Ala Phe Met Gly Ile Met Arg Arg Thr Leu Leu Asp Arg

275 280 285

Val Arg Lys Ala His Pro Glu Leu Ser Val Glu Asn Thr Tyr Gly Tyr

290 295 300

Leu Thr Lys His Lys Arg Ile Ala Leu Gly Leu Pro Lys Thr His Cys

305 310 315 320

Ala Asp Ala Phe Cys Ile Ala Gly Asn Leu Asn Ala Leu Arg Arg Arg

325 330 335

Asp Phe Leu Tyr Gln Arg Gln Thr Arg Lys His Asn Arg Gln Ile His

340 345 350

Lys Cys Ser Ile Leu Lys Gly Gly Val Arg Lys Leu His Gln Ala Pro

355 360 365

Phe Leu Val Lys Gly Phe Arg Leu Phe Asp Lys Val Lys Cys Thr Gly

370 375 380

Arg Ile Gly Ile Ile Phe Gly Arg Arg Ser Thr Gly Ser Phe Asp Val

385 390 395 400

Arg Thr Leu Asp Gly Thr Arg Leu Ser Ala Gly Ile Ser Ser Lys Lys

405 410 415

Leu Thr Leu Leu Glu Lys Arg Thr Thr Phe Leu Thr Gln Leu Arg Lys

420 425 430

<210> 504

<211> 432

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-437 effector

<400> 504

Met Leu Thr Gly Leu Leu Ala Glu Gln Val Asp Pro Ala Gly Ile Arg
1 5 10 15

Lys Gly Asp Thr Leu Lys Val Phe Val Leu Asn Met Arg Gly Lys Pro
20 25 30

Leu Met Pro Cys Ser Pro Ala Lys Ala Arg His Met Leu Lys Ala Gly
35 40 45

Lys Ala Val Val Ala Arg Arg Thr Pro Phe Thr Ile Lys Leu Thr Ile
50 55 60

Ala Thr Gly Glu Thr Lys Gln Asp Val Thr Leu Gly Val Asp Ala Gly
65 70 75 80

Ala Lys His Val Gly Ile Ser Ala Thr Thr Glu Lys Glu Glu Val Phe
85 90 95

Ala Ser Glu Val Glu Leu Arg Gln Asp Ile Thr Gly Leu Leu Ala Asp
100 105 110

Arg Leu Ala Phe Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg
115 120 125

Ala Pro Arg Phe Asn Asn Arg Val Arg Ser Lys His Lys Gly Trp Leu
130 135 140

Ala Pro Ser Val Glu Asn Arg Ile Gln Ala His Ile Ser Arg Ile Glu
145 150 155 160

Ala Val Cys Arg Val Leu Pro Ile Thr Lys Ile Val Ile Glu Thr Ala
165 170 175

Ser Phe Asp Ile Gln Lys Ile Lys Asn Pro Glu Val Glu Gly Thr Asp
180 185 190

Tyr Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn Val Arg Glu Tyr Val
195 200 205

Leu Phe Arg Asp Gly His Val Cys Gln His Cys Arg Gly Arg Ser Lys

210 215 220

Asp Pro Ile Leu Asn Val His His Leu Glu Ser Arg Lys Thr Gly Gly
225 230 235 240
Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu Thr Cys His Lys Ala
245 250 255
Tyr His Ala Gly Lys Ile Lys Leu Lys Thr Arg Arg Gly Thr Ser Phe
260 265 270
Arg Ala Glu Ala Phe Met Gly Ile Met Arg Arg Thr Leu Leu Asp Arg
275 280 285

Val Arg Lys Ala His Pro Glu Leu Ser Val Glu Asn Thr Tyr Gly Tyr
290 295 300
Leu Thr Lys His Lys Arg Ile Ala Leu Gly Leu Pro Lys Thr His Cys
305 310 315 320
Ala Asp Ala Phe Cys Ile Ala Gly Asn Leu Asn Ala Leu Arg Arg Gly
325 330 335
Asp Phe Leu Tyr Gln Arg Gln Thr Arg Lys His Asn Arg Gln Ile His
340 345 350

Lys Cys Ser Ile Leu Lys Gly Gly Val Arg Lys Leu His Gln Ala Pro
355 360 365
Phe Leu Val Lys Gly Phe Arg Leu Phe Asp Lys Val Lys Cys Thr Gly
370 375 380
Arg Ile Gly Ile Ile Phe Gly Arg Arg Ser Thr Gly Ser Phe Asp Val
385 390 395 400
Arg Thr Leu Asp Gly Thr Arg Leu Ser Ala Gly Ile Ser Ser Lys Lys
405 410 415

Leu Thr Leu Leu Glu Lys Arg Thr Thr Phe Leu Thr Gln Leu Arg Lys
420 425 430

<210> 505
<211> 415
<212> PRT
<213> Unknown

<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-438 effector
<400> 505

Met Val Tyr Val Val Ala Asn Asp Gly Gln Pro Leu Met Pro Thr Glu
1 5 10 15
Arg His Gly Lys Val Cys Arg Met Leu Lys Ser Gly Met Ala Lys Val

20 25 30
Ile Lys Lys Cys Pro Phe Thr Ile Gln Leu Gln Tyr Glu Ser Glu Arg
35 40 45
Asn Val Gln Pro Val Ser Leu Gly Val Asp Ala Gly Ser Lys His Ile
50 55 60
Gly Ile Ser Ala Thr Thr Lys Thr Lys Val Leu Tyr Glu Ser Asp Val
65 70 75 80
Glu Leu Arg Asp Asp Ile Val Lys Leu Leu Ala Thr Arg Arg Gln Leu

85 90 95
Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg Pro Ala Arg Phe
100 105 110
Asp Asn Arg Lys Arg Lys Glu Gly Trp Leu Ala Pro Ser Ile Arg Gln
115 120 125
Lys Met Glu Ser His Leu Thr Val Val Ala Asn Val Cys Lys Ile Leu
130 135 140
Pro Val Ser Arg Ile Ile Val Glu Thr Ala Ser Phe Asp Ile Gln Lys

145 150 155 160
Ile Lys Asn Pro Asp Ile Gln Gly Val Glu Tyr Gln Gln Gly Glu Gln
165 170 175
Met Asp Phe Trp Asn Ile Arg Glu Tyr Val Phe Phe Arg Asp Gly His
180 185 190
Thr Cys Gln Cys Cys Lys Gly Arg Ser Lys Asp Lys Ile Leu Asn Val
195 200 205

His His Ile Glu Ser Arg Lys Thr Gly Gly Asn Ala Pro Asn Asn Leu

210 215 220

Ile Thr Leu Cys Glu Thr Cys His Lys Gly Tyr His Asn Gly Thr Val

225 230 235 240

Ile Leu Pro Lys Asn Ile Lys Arg Gly Met Lys Phe Lys Asp Ala Ala

245 250 255

Phe Met Gly Ile Met Arg Trp Ala Phe Tyr Asn Ala Leu Lys Glu Gln

260 265 270

Tyr Glu Pro Ala Ile Pro Val Ser Met Thr Tyr Gly Tyr Leu Thr Lys

275 280 285

Asn Thr Arg Ile Arg His Asn Leu Pro Lys Glu His His Ile Asp Ala

290 295 300

Arg Cys Ile Ser Gly Asn Pro Asp Ala Val Ser Asp Gly Thr Tyr Tyr

305 310 315 320

Tyr Gln Lys Lys Val Arg Cys His Asn Arg Gln Ile His Lys Gln Thr

325 330 335

Ile Leu Lys Gly Gly Ile Arg Lys Ser Asn Gln Ala Glu Tyr Leu Val

340 345 350

Lys Gly Tyr Arg Leu Phe Asp Lys Val Arg Tyr His Gly Arg Glu Tyr

355 360 365

Phe Ile Phe Gly Arg Arg Lys Thr Gly Phe Phe Asp Ile Arg Thr Leu

370 375 380

Ser Gly Glu Lys Val Asn Lys Gly Ser Ile Ser Val Lys Lys Leu Thr

385 390 395 400

Phe Ala Asp Thr Arg Lys Asn Tyr Leu Thr Glu Arg Arg Thr Val

405 410 415

<210> 506

<211> 415

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-439 effector

<400> 506

Met Val Tyr Val Val Ala Asn Asp Gly Gln Pro Leu Met Pro Thr Asn
1 5 10 15

Arg Tyr Gly Lys Val Tyr Arg Met Leu Arg Ser Gly Met Ala Val Val
20 25 30

Val Lys Lys Cys Pro Phe Thr Ile Gln Leu Gln Tyr Glu Ser Glu Arg
35 40 45

Asn Val Gln Pro Val Val Leu Gly Ile Asp Ala Gly Ser Lys His Val
50 55 60

Gly Val Ser Ala Thr Thr Lys Ala Lys Val Leu Tyr Glu Ser Asp Val
65 70 75 80

Glu Leu Arg Gly Asp Ile Val Lys Leu Leu Ala Thr Arg Arg Gln Leu
85 90 95

Arg Arg Ser Arg Arg Ser Arg Lys Thr Arg Tyr Arg Pro Ala Arg Phe
100 105 110

Asp Asn Arg Lys Arg Lys Asn Gly Trp Leu Ala Pro Ser Ile Arg Gln
115 120 125

Lys Ile Glu Ser His Leu Thr Val Val Ala Asn Val Cys Lys Ile Leu
130 135 140

Pro Val Ser Arg Ile Ile Val Glu Thr Ala Ser Phe Asp Ile Gln Lys
145 150 155 160

Ile Lys Asn Pro Asp Ile Gln Gly Thr Glu Tyr Gln Gln Gly Glu Gln
165 170 175

Met Asp Phe Trp Asn Val Arg Glu Tyr Val Phe Phe Arg Asp Gly His
180 185 190

Thr Cys Gln Cys Cys Lys Gly Arg Ser Lys Asp Lys Ile Leu Asn Val
195 200 205

His His Ile Glu Ser Arg Lys Thr Gly Gly Asn Ala Pro Asn Asn Leu

210 215 220

Ile Thr Leu Cys Glu Thr Cys His Lys Gly Tyr His Asn Gly Met Val
225 230 235 240
Thr Leu Pro Lys Asn Ile Lys Arg Gly Met Lys Phe Lys Asp Val Ala
245 250 255
Phe Met Gly Ile Met Arg Trp Thr Phe Tyr Asn Thr Leu Lys Glu Gln
260 265 270
Tyr Glu Pro Asp Ile Pro Val Ser Met Thr Tyr Gly Tyr Leu Thr Lys
275 280 285

Asn Thr Arg Ile Cys His Asp Leu Pro Lys Gly His Cys Ile Asp Ala
290 295 300
Arg Cys Ile Ser Gly Asn Pro Asp Ala Val Ser Asp Gly Thr Tyr Tyr
305 310 315 320
Tyr Gln Lys Lys Val Arg Cys His Asn Arg Gln Ile His Lys Gln Thr
325 330 335
Ile Leu Lys Gly Gly Val Arg Lys Ser Asn Gln Ala Glu Tyr Leu Val
340 345 350

Lys Gly Tyr Arg Leu Phe Asp Lys Val Arg Tyr Gln Gly Met Glu Tyr
355 360 365
Phe Ile Phe Gly Arg Arg Lys Ser Gly Phe Phe Asp Ile Arg Thr Leu
370 375 380
Ser Gly Glu Lys Val Asn Lys Gly Ser Ile Ser Val Lys Lys Leu Thr
385 390 395 400
Phe Val Asp Thr Arg Lys Asn Tyr Leu Ile Glu Arg Arg Thr Val
405 410 415

<210> 507
<211> 432
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-440 effector

<400> 507

Met Leu Thr Gly Leu Leu Ala Glu Gln Val Asp Pro Ala Gly Ile Arg
1 5 10 15

Lys Gly Asp Thr Leu Lys Val Phe Val Leu Asn Met Arg Gly Lys Pro
20 25 30

Leu Met Pro Cys Ser Pro Ala Lys Ala Arg His Met Leu Lys Ala Gly
35 40 45

Lys Ala Val Val Ala Arg Arg Thr Pro Phe Thr Ile Lys Leu Thr Ile
50 55 60

Ala Thr Gly Glu Thr Lys Gln Asp Val Thr Leu Gly Val Asp Ala Gly
65 70 75 80

Ala Lys His Val Gly Ile Ser Ala Thr Thr Glu Lys Glu Glu Val Phe
85 90 95

Ala Ser Glu Val Glu Leu Arg Gln Asp Ile Thr Gly Leu Leu Ala Asp
100 105 110

Arg Leu Ala Phe Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg
115 120 125

Ala Pro Arg Phe Asp Asn Arg Val Arg Ser Lys His Lys Gly Trp Leu
130 135 140

Ala Pro Ser Val Glu Asn Arg Ile Gln Ala His Ile Ser Arg Ile Glu
145 150 155 160

Ala Val Cys Arg Val Leu Pro Ile Thr Lys Ile Val Ile Glu Thr Ala
165 170 175

Ser Phe Asp Ile Gln Lys Ile Lys Asn Pro Glu Val Glu Gly Thr Asp
180 185 190

Tyr Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn Val Arg Glu Tyr Val
195 200 205

Leu Phe Arg Asp Gly His Val Cys Gln His Cys Arg Gly Arg Ser Lys
210 215 220

Asp Pro Ile Leu Asn Val His His Leu Glu Ser Arg Lys Thr Gly Gly

225 230 235 240

Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu Thr Cys His Lys Ala

245 250 255

Tyr His Ala Gly Lys Ile Lys Leu Lys Ala Arg Arg Gly Thr Ser Phe

260 265 270

Arg Ala Glu Ala Phe Met Gly Ile Met Arg Arg Thr Leu Leu Asp Arg

275 280 285

Val Arg Lys Ala His Pro Glu Leu Ser Val Glu Asn Thr Tyr Gly Tyr

290 295 300

Leu Thr Lys His Lys Arg Ile Ala Leu Gly Leu Pro Lys Thr His Cys

305 310 315 320

Ala Asp Ala Phe Cys Ile Ala Gly Asn Leu Asn Ala Leu Arg Arg Gly

325 330 335

Asp Phe Leu Tyr Gln Arg Gln Thr Arg Lys His Asn Arg Gln Ile His

340 345 350

Lys Cys Ser Ile Leu Lys Gly Gly Val Arg Lys Leu His Gln Ala Pro

355 360 365

Phe Leu Val Lys Gly Phe Arg Leu Phe Asp Lys Val Lys Cys Thr Gly

370 375 380

Arg Ile Gly Ile Ile Phe Gly Arg Arg Ser Thr Gly Ser Phe Asp Val

385 390 395 400

Arg Thr Leu Asp Gly Thr Arg Leu Ser Ala Asp Ile Ser Ser Lys Lys

405 410 415

Leu Thr Leu Leu Glu Lys Arg Thr Thr Phe Leu Thr Gln Leu Arg Lys

420 425 430

<210> 508

<211> 415

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-441 effector

<400> 508

Met Val Tyr Val Leu Ala Asn Asp Gly Gln Pro Leu Met Pro Thr Glu
1 5 10 15

Arg His Gly Lys Val Cys Arg Met Leu Lys Ser Gly Ile Ala Lys Val
20 25 30

Val Lys Lys Cys Pro Phe Thr Ile Gln Leu Gln Tyr Glu Ser Glu Arg
35 40 45

Asn Val Gln Pro Val Ala Leu Gly Ile Asp Ala Gly Ser Lys His Val
50 55 60

Gly Val Ser Ala Thr Thr Lys Ala Lys Val Leu Tyr Glu Ser Asp Val
65 70 75 80

Glu Leu Arg Asp Asp Ile Val Lys Leu Leu Ala Thr Arg Arg Gln Leu
85 90 95

Arg Arg Arg Arg Arg Ser Arg Lys Thr Arg Tyr Arg Pro Ala Arg Phe
100 105 110

Asp Asn Arg Arg Arg Lys Glu Gly Trp Leu Ala Pro Ser Ile Arg Gln
115 120 125

Lys Ile Glu Ser His Leu Thr Val Val Ala Asn Val Cys Lys Ile Leu
130 135 140

Pro Val Ser Gln Ile Ile Val Glu Thr Ala Ser Phe Asp Ile Gln Lys
145 150 155 160

Ile Lys Asn Pro Asp Ile Gln Gly Ile Glu Tyr Gln Gln Gly Glu Gln
165 170 175

Met Asp Phe Trp Asn Ile Arg Glu Tyr Val Leu Phe Arg Asp Gly His
180 185 190

Thr Cys Gln Cys Cys Lys Gly Lys Ser Lys Asp Lys Val Leu Asn Val
195 200 205

His His Ile Glu Ser Arg Lys Thr Gly Gly Asn Ala Pro Asn Asn Leu

210 215 220

Ile Thr Leu Cys Glu Thr Cys His Lys Gly Tyr His Asn Gly Thr Val
225 230 235 240
Thr Leu Pro Lys Asn Ile Lys Arg Gly Met Lys Phe Lys Asp Ala Ala
245 250 255
Phe Met Gly Ile Met Arg Trp Thr Phe Tyr Asn Thr Leu Lys Glu Gln
260 265 270
Tyr Glu Pro Asp Ile Pro Val His Tyr Thr Tyr Gly Tyr Ile Thr Lys
275 280 285

Asn Thr Arg Ile Asn His Asn Leu Pro Lys Gly His Cys Ile Asp Ala
290 295 300
Arg Cys Ile Ser Gly Asn Pro Asp Ala Val Ser Asp Gly Thr Tyr Tyr
305 310 315 320
Tyr Gln Lys Lys Val Arg Cys His Asn Arg Gln Ile His Ile Gln Thr
325 330 335
Ile Leu Lys Gly Gly Ile Arg Lys Ser Asn Gln Ala Glu Tyr Leu Val
340 345 350

Arg Gly Phe Arg Leu Phe Asp Lys Val Arg Tyr Gln Gly Arg Glu Tyr
355 360 365
Phe Ile Phe Gly Arg Arg Lys Ser Gly Phe Phe Asp Ile Arg Thr Leu
370 375 380
Ser Gly Glu Lys Val Asn Lys Gly Ser Ile Asn Val Lys Arg Leu Thr
385 390 395 400
Phe Val Asp Thr Arg Lys Asn Tyr Leu Thr Glu Arg Arg Thr Val
405 410 415

<210> 509
<211> 415
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-442 effector

<400> 509

Met Val Tyr Val Val Ala Asn Asp Gly Gln Pro Leu Met Pro Thr Glu
1 5 10 15

Arg His Gly Lys Val Cys Arg Met Leu Lys Ser Gly Met Ala Lys Val
20 25 30

Val Lys Lys Cys Pro Phe Thr Ile Gln Leu Gln Tyr Glu Ser Glu Arg

35 40 45

Asn Val Gln Pro Val Ser Leu Gly Val Asp Ala Gly Ser Lys His Ile
50 55 60

Gly Ile Ser Ala Thr Thr Lys Thr Lys Val Leu Tyr Glu Ser Asp Val
65 70 75 80

Glu Leu Arg Asp Asp Ile Val Lys Leu Leu Ala Thr Arg Arg Gln Leu
85 90 95

Arg Leu Ser Arg Arg Ser Arg Lys Thr Arg Tyr Arg Pro Val Arg Phe

100 105 110

Asp Asn Arg Lys Arg Lys Glu Gly Trp Leu Ala Pro Ser Ile Arg Gln
115 120 125

Lys Ile Gly Ser His Leu Thr Val Val Ala Asn Val Cys Lys Ile Leu
130 135 140

Pro Ile Asn Gln Ile Ile Val Glu Thr Ala Ser Phe Asp Ile Gln Lys
145 150 155 160

Ile Lys Asp Pro Glu Ile Gln Gly Ile Glu Tyr Gln Gln Gly Glu Gln

165 170 175

Met Asp Phe Trp Asn Ile Arg Glu Tyr Val Leu Phe Arg Asp Gly His
180 185 190

Thr Cys Gln Cys Cys Lys Gly Arg Ser Lys Asp Lys Ile Leu Asn Val
195 200 205

His His Ile Glu Ser Arg Lys Thr Gly Gly Asn Ala Pro Asn Asn Leu
210 215 220

Ile Thr Leu Cys Glu Thr Cys His Lys Gly Tyr His Asn Gly Thr Val

225 230 235 240

Ile Leu Pro Lys Asn Ile Lys His Gly Met Gln Phe Lys Asp Ala Ala

245 250 255

Phe Met Gly Ile Met Arg Trp Thr Phe Tyr Asn Thr Leu Lys Glu Gln

260 265 270

Tyr Glu Pro Asp Ile Pro Val Ser Met Thr Tyr Gly Tyr Leu Thr Lys

275 280 285

Asn Thr Arg Ile Glu His Gly Leu Pro Lys Glu His Tyr Ile Asp Ala

290 295 300

Arg Cys Ile Ser Gly Asn Pro Asp Ala Val Ser Asp Gly Thr Tyr Tyr

305 310 315 320

Tyr Gln Lys Lys Val Arg Cys His Asn Arg Gln Ile His Lys Gln Thr

325 330 335

Ile Leu Lys Asp Gly Val Arg Lys Ser Asn Gln Ala Glu Tyr Leu Val

340 345 350

Lys Gly Tyr Arg Leu Phe Asp Lys Val Arg Tyr Gln Gly Arg Glu Tyr

355 360 365

Phe Ile Phe Gly Arg Arg Lys Ser Gly Phe Phe Asp Ile Arg Thr Leu

370 375 380

Ser Gly Glu Lys Val Asn Lys Gly Ser Ile Ser Val Lys Lys Leu Thr

385 390 395 400

Phe Ala Asp Thr Arg Lys Asn Tyr Leu Thr Glu Arg Arg Thr Val

405 410 415

<210> 510

<211> 415

<212> PRT

<213> Unknown

<220>

<223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-443 effector

<400> 510

Met Val Tyr Val Leu Ala Asn Asp Gly Gln Pro Leu Met Pro Thr Glu
1 5 10 15

Arg His Gly Lys Val Cys Arg Met Leu Lys Ser Gly Ile Ala Lys Val
20 25 30

Val Lys Lys Cys Pro Phe Thr Ile Gln Leu Gln Tyr Glu Ser Glu Arg
35 40 45

Asn Val Gln Pro Val Ala Leu Gly Ile Asp Ala Gly Ser Lys His Val
50 55 60

Gly Val Ser Ala Thr Thr Lys Ala Lys Val Leu Tyr Glu Ser Asp Val
65 70 75 80

Glu Leu Arg Asp Asp Ile Val Lys Leu Leu Ala Thr Arg Arg Gln Leu
85 90 95

Arg Arg Arg Arg Arg Ser Arg Lys Thr Arg Tyr Arg Pro Ala Arg Phe
100 105 110

Asp Asn Arg Arg Arg Lys Glu Gly Trp Leu Thr Pro Ser Ile Arg Gln
115 120 125

Lys Ile Glu Ser His Leu Thr Val Val Ala Asn Val Cys Lys Ile Leu
130 135 140

Pro Val Ser Gln Ile Ile Val Glu Thr Ala Ser Phe Asp Ile Gln Lys
145 150 155 160

Ile Lys Asn Pro Asp Ile Gln Gly Ile Glu Tyr Gln Gln Gly Glu Gln
165 170 175

Met Asp Phe Trp Asn Ile Arg Glu Tyr Val Leu Phe Arg Asp Gly His
180 185 190

Thr Cys Gln Cys Cys Lys Gly Lys Ser Lys Asp Lys Val Leu Asn Val
195 200 205

His His Ile Glu Ser Arg Lys Thr Gly Gly Asn Ala Pro Asn Asn Leu
210 215 220

Ile Thr Leu Cys Glu Thr Cys His Lys Gly Tyr His Asn Gly Thr Val

225 230 235 240

Thr Leu Pro Lys Asn Ile Lys Arg Gly Met Lys Phe Lys Asp Ala Ala
245 250 255
Phe Met Gly Ile Met Arg Trp Thr Phe Tyr Asn Thr Leu Lys Glu Gln
260 265 270
Tyr Glu Pro Asp Ile Pro Val His Tyr Thr Tyr Gly Tyr Ile Thr Lys
275 280 285
Asn Thr Arg Ile Asn His Asn Leu Pro Lys Gly His Cys Ile Asp Ala
290 295 300

Arg Cys Ile Ser Gly Asn Pro Asp Ala Val Ser Asp Gly Thr Tyr Tyr
305 310 315 320
Tyr Gln Lys Lys Val Arg Cys His Asn Arg Gln Ile His Lys Gln Thr
325 330 335
Ile Leu Lys Gly Gly Ile Arg Lys Ser Asn Gln Ala Glu Tyr Leu Val
340 345 350
Arg Gly Phe Arg Leu Phe Asp Lys Val Arg Tyr Gln Gly Arg Glu Tyr
355 360 365

Phe Ile Phe Gly Arg Arg Lys Ser Gly Phe Phe Asp Ile Arg Thr Leu
370 375 380
Ser Gly Glu Lys Val Asn Lys Gly Ser Ile Asn Val Lys Arg Leu Thr
385 390 395 400
Phe Val Asp Thr Arg Lys Asn Tyr Leu Thr Glu Arg Arg Thr Val
405 410 415

<210> 511
<211> 389
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220>
<223> Category: MG35 effectors
<220><223> Description: MG35-444 effector

<400> 511

Met Leu Lys Ala Gly Lys Ala Val Val Ala Arg Arg Thr Pro Phe Thr
1 5 10 15
Ile Lys Leu Thr Ile Ala Thr Gly Glu Thr Lys Gln Asp Val Thr Leu
20 25 30
Gly Val Asp Ala Gly Ala Lys His Val Gly Ile Ser Ala Thr Thr Glu
35 40 45
Lys Glu Glu Val Phe Ala Ser Glu Val Glu Leu Arg Gln Asp Ile Thr

50 55 60
Gly Leu Leu Ala Asp Arg Leu Ala Phe Arg Arg Ser Arg Arg Asn Arg
65 70 75 80
Lys Thr Arg Tyr Arg Val Pro Arg Phe Asn Asn Arg Val Arg Ser Lys
85 90 95
His Lys Gly Trp Leu Ala Pro Ser Val Glu Asn Arg Leu Gln Ala His
100 105 110
Ile Ser Arg Ile Glu Ala Val Cys Arg Val Leu Pro Ile Thr Lys Ile

115 120 125
Val Ile Glu Thr Ala Ser Phe Asp Ile Gln Lys Ile Lys Asn Pro Glu
130 135 140
Val Glu Gly Thr Asp Tyr Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn
145 150 155 160
Val Arg Glu Tyr Val Leu Phe Arg Asp Gly His Val Cys Gln His Cys
165 170 175
Arg Gly Arg Ser Lys Asp Pro Ile Leu Asn Val His His Leu Glu Ser

180 185 190
Arg Lys Thr Gly Gly Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu
195 200 205
Thr Cys His Lys Ala Tyr His Ala Gly Lys Ile Lys Leu Lys Thr Arg
210 215 220
Arg Gly Thr Ser Phe Arg Ala Glu Ala Phe Met Gly Ile Met Arg Arg
225 230 235 240

Thr Leu Leu Asp Arg Val Arg Lys Ala His Pro Glu Leu Ser Val Glu

245 250 255

Asn Thr Tyr Gly Tyr Leu Thr Lys His Lys Arg Ile Ala Leu Gly Leu

260 265 270

Pro Lys Thr His Cys Ala Asp Ala Phe Cys Ile Ala Gly Asn Leu Asn

275 280 285

Ala Leu Arg Arg Gly Asp Phe Leu Tyr Gln Arg Gln Thr Arg Lys His

290 295 300

Asn Arg Gln Ile His Lys Cys Ser Ile Leu Lys Gly Gly Val Arg Lys

305 310 315 320

Leu His Gln Ala Pro Phe Leu Val Lys Gly Phe Arg Leu Phe Asp Lys

325 330 335

Val Lys Cys Thr Gly Arg Ile Gly Ile Ile Phe Gly Arg Arg Ser Thr

340 345 350

Gly Ser Phe Asp Val Arg Thr Leu Asp Gly Thr Arg Leu Ser Ala Gly

355 360 365

Ile Ser Ser Lys Lys Leu Thr Leu Leu Glu Lys Arg Thr Thr Phe Leu

370 375 380

Thr Gln Leu Arg Lys

385

<210> 512

<211> 337

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-445 effector

<400> 512

Val Thr Leu Arg Asn Asp Ile Val Asn Leu Leu Ser Thr Arg Arg Glu

1 5 10 15

Ala Arg Arg Thr Arg Arg Ser Arg Lys Thr Arg Tyr Arg Lys Pro Arg

20 25 30

Phe Asn Asn Arg Thr Arg Lys Asp Gly Trp Leu Ala Pro Ser Val Arg

35 40 45

Gln Lys Val Asp Thr His Leu Thr Thr Val Arg Lys Val Thr Glu Ile

50 55 60

Leu Pro Val Asn Ser Ile Thr Val Glu Thr Ala Ser Phe Asp Ile Gln

65 70 75 80

Lys Ile Lys Asn Leu Asn Ile Val Ser Thr Asp Tyr Gln His Gly Glu

85 90 95

Gln Phe Asp Phe Trp Asn Val Arg Glu Tyr Ile Leu Phe Arg Asp Gly

100 105 110

His Lys Cys Gln Cys Cys Lys Gly Lys Ser Lys Asp Pro Val Leu Asn

115 120 125

Val His His Ile Glu Ser Arg Lys Thr Gly Gly Asn Ala Pro Asn Asn

130 135 140

Leu Ile Thr Leu Cys Glu Thr Cys His Lys Gly Tyr His Asn Gly Thr

145 150 155 160

Val Ser Leu Pro Lys Asn Ile Arg Arg Gly Met Lys Phe Asn Asp Ala

165 170 175

Ala Phe Met Gly Ile Met Arg Leu Ala Phe Phe Asn Lys Val Lys Glu

180 185 190

Thr Tyr Glu Pro Leu Gly Ile Met Val Asn Met Thr Tyr Gly Tyr Ile

195 200 205

Thr Lys Asn Thr Arg Ile Glu His Asn Leu Pro Lys Asp His Phe Ile

210 215 220

Asp Ala Arg Cys Ile Ser Gly His Pro Asp Ala Thr Ser Asp Gly Thr

225 230 235 240

Val Phe Tyr Gln Lys Lys Val Arg Cys His Asn Arg Gln Ile His Lys

245 250 255

Gln Lys Ile Phe Lys Gly Gly Ile Arg Lys Arg Asn Gln Ala Pro Tyr

260 265 270

Glu Val Lys Gly Phe Arg Leu Tyr Asp Glu Val Leu Trp Lys Gly Gln

275 280 285

Lys Cys Phe Ile Phe Gly Arg Arg Ser Thr Gly Arg Met Asp Leu Arg

290 295 300

Leu Leu Asp Gly Thr His Ile Asn Ala Ser Val Gly Tyr Lys Asn Leu

305 310 315 320

Lys Leu Leu Arg Lys Arg Ser Asn Tyr Leu Thr Glu Gln Arg Lys Val

325 330 335

Gly

<210> 513

<211> 413

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-446 effector

<400> 513

Met Arg Gly Lys Pro Leu Met Pro Cys Ser Pro Ala Lys Ala Arg His

1 5 10 15

Met Leu Lys Ala Gly Lys Ala Val Val Val Arg Arg Thr Pro Phe Thr

20 25 30

Ile Lys Leu Thr Ile Ala Thr Gly Glu Thr Lys Gln Asp Val Thr Leu

35 40 45

Gly Val Asp Ala Gly Ala Arg His Val Gly Ile Ser Ala Thr Thr Glu

50 55 60

Lys Glu Glu Val Phe Ala Ser Glu Val Ala Leu Arg Gln Asp Ile Thr

65 70 75 80

Gly Leu Leu Ala Asp Arg Leu Ala Phe Arg Arg Ala Arg Arg Asn Arg

85 90 95

Lys Thr Arg Tyr Arg Ala Pro Arg Phe Asn Asn Arg Val Arg Ser Lys
100 105 110

His Lys Gly Trp Leu Ala Pro Ser Val Glu Asn Arg Ile Gln Ala His
115 120 125
Met Ser Arg Ile Glu Ala Val Cys Arg Leu Leu Pro Val Thr Lys Ile
130 135 140
Val Ile Glu Thr Ala Ser Phe Asp Ile Gln Lys Ile Arg Asn Pro Glu
145 150 155 160
Val Glu Gly Thr Gly Tyr Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn
165 170 175

Val Arg Glu Tyr Val Leu Phe Arg Asp Gly His Ile Cys Gln His Cys
180 185 190
Arg Gly Arg Ser Lys Asp Pro Ile Leu Asn Val His His Leu Glu Ser
195 200 205
Arg Lys Thr Gly Gly Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu
210 215 220
Thr Cys His Lys Ala Tyr His Ala Gly Lys Ile Lys Leu Lys Val Lys
225 230 235 240

Arg Gly Gln Ser Phe Arg Ala Glu Ala Phe Met Gly Ile Met Arg Trp
245 250 255
Thr Leu Leu Asp Arg Val Arg Lys Thr His Pro Lys Leu Pro Val Glu
260 265 270
Asn Thr Tyr Gly Tyr Leu Thr Lys His Lys Arg Ile Ala Leu Gly Leu
275 280 285
Pro Lys Thr His Cys Ala Asp Ala Phe Cys Ile Ala Gly Asn Leu Lys
290 295 300

Ala Leu Arg Arg Gly Asp Phe Leu Phe Gln Gln Gln Thr Arg Lys His
305 310 315 320
Asn Arg Gln Ile His Arg Cys Ser Ile Leu Lys Gly Gly Val Arg Lys
325 330 335
Leu Asn Gln Thr Pro Phe Leu Val Lys Gly Phe Arg Leu Phe Asp Lys

340 345 350

Val Lys Cys Lys Gly Arg Ile Gly Phe Ile Phe Gly Arg Arg Ser Phe

355 360 365

Gly Tyr Phe Asp Val Arg Thr Leu Asp Gly Val Arg Leu Ser Ala Asn

370 375 380

Val Ser Phe Lys Lys Leu Met Leu Val Glu Lys Arg Thr Thr Phe Leu

385 390 395 400

Thr Gln Leu Arg Lys Glu Cys Gly Ala Ser Ser Pro Ser

405 410

<210> 514

<211> 406

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-447 effector

<400> 514

Met Arg Gly Lys Pro Leu Met Pro Cys Ser Pro Ala Lys Ala Arg His

1 5 10 15

Met Leu Lys Ala Gly Lys Ala Val Val Val Arg Arg Thr Pro Phe Thr

20 25 30

Ile Lys Leu Thr Ile Ala Thr Gly Glu Thr Lys Gln Asp Val Thr Leu

35 40 45

Gly Val Asp Ala Gly Ala Arg His Val Gly Ile Ser Ala Thr Thr Glu

50 55 60

Lys Glu Glu Val Phe Ala Ser Glu Val Ala Leu Arg Gln Asp Ile Thr

65 70 75 80

Gly Leu Leu Ala Asp Arg Leu Ala Phe Arg Arg Ala Arg Arg Asn Arg

85 90 95

Lys Thr Arg Tyr Arg Ala Pro Arg Phe Asn Asn Arg Val Arg Ser Lys

100 105 110

His Lys Gly Trp Leu Ala Pro Ser Val Glu Asn Arg Ile Gln Ala His

115 120 125

Met Ser Arg Ile Glu Ala Val Cys Arg Leu Leu Pro Val Thr Lys Ile

130 135 140

Val Ile Glu Thr Ala Ser Phe Asp Ile Gln Lys Ile Arg Asn Pro Glu

145 150 155 160

Val Glu Gly Thr Gly Tyr Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn

165 170 175

Val Arg Glu Tyr Val Leu Phe Arg Asp Gly His Val Cys Gln His Cys

180 185 190

His Gly Arg Ser Arg Asp Lys Ile Leu Asn Val His His Leu Glu Ser

195 200 205

Arg Lys Thr Gly Gly Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu

210 215 220

Thr Cys His Lys Ala Tyr His Ala Gly Lys Ile Lys Leu Lys Val Lys

225 230 235 240

Arg Gly Gln Ser Phe Arg Ala Glu Ala Phe Met Gly Ile Met Arg Trp

245 250 255

Thr Leu Leu Asp Arg Val Arg Lys Thr His Pro Lys Leu Pro Val Glu

260 265 270

Asn Thr Tyr Gly Tyr Leu Thr Lys His Lys Arg Ile Ala Leu Gly Leu

275 280 285

Pro Lys Thr His Cys Ala Asp Ala Phe Cys Ile Ala Gly Asn Leu Lys

290 295 300

Ala Leu Arg Arg Gly Asp Phe Leu Phe Gln Gln Gln Thr Arg Lys His

305 310 315 320

Asn Arg Gln Ile His Lys Cys Ser Ile Leu Lys Gly Gly Val Arg Lys

325 330 335

Leu Asn Gln Ala Pro Phe Leu Val Lys Gly Phe Arg Leu Phe Asp Lys

340 345 350

Val Arg Ile Gly Gly Gln Ile Gly Phe Val Phe Gly Arg Arg Val Arg

355 360 365

Gly Thr Phe Asn Ile Arg Arg Leu Asp Lys Thr Val Ile Gly Thr Asp

370 375 380

Ile Asn Cys Lys Lys Leu Ser Leu Leu Glu Thr Arg Lys Thr Phe Leu

385 390 395 400

Thr Glu Leu Arg Lys Glu

405

<210> 515

<211> 401

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-448 effector

<400> 515

Met Arg Gly Lys Pro Leu Met Pro Cys Ser Pro Ala Lys Ala Arg His

1 5 10 15

Met Leu Lys Ala Gly Lys Ala Val Val Val Arg Arg Thr Pro Phe Thr

20 25 30

Ile Lys Leu Thr Ile Ala Thr Gly Glu Thr Lys Gln Asp Val Thr Leu

35 40 45

Gly Val Asp Ala Gly Ala Arg His Val Gly Ile Ser Ala Thr Thr Glu

50 55 60

Lys Glu Glu Val Phe Ala Ser Glu Val Ala Leu Arg Gln Asp Ile Thr

65 70 75 80

Gly Leu Leu Ala Asp Arg Leu Ala Phe Arg Arg Ala Arg Arg Asn Arg

85 90 95

Lys Thr Arg Tyr Arg Ser Pro Arg Phe Asn Asn Arg Val Arg Ser Lys

100 105 110

His Lys Gly Trp Leu Ala Ser Ser Val Glu Asn Arg Ile Gln Ala His

115 120 125

Met Ser Arg Ile Asp Ala Val Cys Arg Leu Leu Pro Val Thr Lys Ile

130 135 140

Val Ile Glu Ala Ala Ser Phe Asp Val Gln Lys Ile Lys Asn Pro Thr

145 150 155 160

Ile Glu Gly Thr Asp Tyr Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn

165 170 175

Val Arg Glu Tyr Val Leu Phe Arg Asp Gly His Ile Cys Gln His Cys

180 185 190

Arg Gly Arg Ser Lys Asp Pro Ile Leu Asn Val His His Leu Glu Ser

195 200 205

Arg Lys Thr Gly Gly Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu

210 215 220

Thr Cys His Lys Ala Tyr His Ala Gly Lys Ile Lys Leu Lys Val Lys

225 230 235 240

Arg Gly Gln Ser Phe Arg Ala Glu Ala Phe Met Gly Ile Met Arg Trp

245 250 255

Thr Leu Leu Asp Arg Val Arg Lys Thr His Pro Lys Leu Pro Val Glu

260 265 270

Asn Thr Tyr Gly Tyr Leu Thr Lys His Lys Arg Ile Ala Leu Gly Leu

275 280 285

Pro Lys Thr His Cys Ala Asp Ala Phe Cys Ile Ala Gly Asn Leu Lys

290 295 300

Ala Leu Arg Arg Gly Asp Phe Leu Phe Gln Gln Gln Thr Arg Lys His

305 310 315 320

Asn Arg Gln Ile His Arg Cys Ser Ile Leu Lys Gly Gly Val Arg Lys

325 330 335

Leu Asn Gln Ala Pro Phe Leu Val Lys Gly Phe Arg Leu Phe Asp Lys

340 345 350

Val Arg Ile Gly Gly Gln Ile Gly Phe Val Phe Gly Arg Arg Val Arg

355 360 365

Gly Ile Phe Asn Ile Arg Arg Leu Asp Lys Thr Val Ile Gly Lys Asp

370 375 380

Ile Asn Cys Lys Lys Thr Glu Ser Ser Arg Asn Thr Gln Asn Phe Phe

385 390 395 400

Asp

<210> 516

<211> 389

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-449 effector

<400> 516

Met Leu Lys Ala Gly Lys Ala Val Val Ala Arg Arg Thr Pro Phe Thr

1 5 10 15

Ile Lys Leu Thr Ile Ala Thr Gly Glu Thr Lys Gln Asp Val Thr Leu

20 25 30

Gly Val Asp Ala Gly Ala Lys His Val Gly Ile Ser Ala Thr Thr Glu

35 40 45

Lys Glu Glu Val Phe Ala Ser Glu Val Glu Leu Arg Gln Asp Ile Thr

50 55 60

Gly Leu Leu Ala Asp Arg Leu Ala Phe Arg Arg Ser Arg Arg Asn Arg

65 70 75 80

Lys Thr Arg Tyr Arg Ala Pro Arg Phe Asn Asn Arg Val Arg Ser Lys

85 90 95

His Lys Gly Trp Leu Ala Pro Ser Val Glu Asn Arg Ile Gln Ala His

100 105 110

Ile Ser Arg Ile Glu Ala Ile Cys Arg Val Leu Pro Ile Thr Lys Ile

115 120 125

Val Ile Glu Thr Ala Ser Phe Asp Ile Gln Lys Ile Lys Asn Pro Glu

130 135 140

Val Glu Gly Thr Asp Tyr Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn
145 150 155 160

Val Arg Glu Tyr Val Leu Phe Arg Asp Gly His Val Cys Gln His Cys
165 170 175
Arg Gly Arg Ser Lys Asp Pro Ile Leu Asn Val His His Leu Glu Ser
180 185 190
Arg Lys Thr Gly Gly Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu
195 200 205
Thr Ser His Lys Ala Tyr His Ala Gly Lys Ile Lys Leu Lys Thr Arg
210 215 220

Arg Gly Thr Ser Phe Arg Ala Glu Ala Phe Met Gly Ile Met Arg Arg
225 230 235 240
Thr Leu Leu Asp Arg Val Arg Lys Ala His Pro Glu Leu Ser Val Glu
245 250 255
Asn Thr Tyr Gly Tyr Leu Thr Lys His Lys Arg Ile Ala Leu Gly Leu
260 265 270
Pro Lys Thr His Cys Ala Asp Ala Phe Cys Ile Ala Gly Asn Leu Asn
275 280 285

Ala Leu Arg Arg Gly Asp Phe Leu Tyr Gln Arg Gln Thr Arg Lys His
290 295 300
Asn Arg Gln Ile His Lys Cys Ser Ile Leu Lys Gly Gly Val Arg Lys
305 310 315 320
Leu His Gln Ala Pro Phe Leu Val Lys Gly Phe Arg Leu Phe Asp Lys
325 330 335
Val Lys Cys Thr Gly Arg Ile Gly Ile Ile Phe Gly Arg Arg Ser Thr
340 345 350

Gly Ser Phe Asp Val Arg Thr Leu Asp Gly Thr Arg Leu Ser Ala Gly
355 360 365
Ile Ser Ser Lys Lys Leu Thr Leu Leu Glu Lys Arg Thr Thr Phe Leu
370 375 380
Thr Gln Leu Arg Lys

385

<210> 517

<211> 389

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-450 effector

<

400> 517

Met Leu Lys Ala Gly Lys Ala Val Val Ala Arg Arg Thr Pro Phe Thr
1 5 10 15

Ile Lys Leu Thr Ile Ala Thr Gly Glu Thr Lys Gln Asp Val Thr Leu
20 25 30

Gly Val Asp Ala Gly Ala Lys His Val Gly Ile Ser Ala Thr Thr Glu
35 40 45

Lys Glu Glu Val Phe Ala Ser Glu Val Glu Leu Arg Gln Asp Ile Thr
50 55 60

Gly Leu Leu Ala Asp Arg Leu Ala Phe Arg Arg Ser Arg Arg Asn Arg
65 70 75 80

Lys Thr Arg Tyr Arg Ala Pro Arg Phe Asn Asn Arg Val Arg Ser Lys
85 90 95

His Lys Gly Trp Leu Ala Pro Ser Val Glu Asn Arg Thr Gln Ala His
100 105 110

Ile Ser Arg Ile Glu Ala Ile Cys Arg Val Leu Pro Ile Thr Lys Ile
115 120 125

Val Ile Glu Thr Ala Ser Phe Asp Ile Gln Lys Ile Lys Asn Pro Glu
130 135 140

Val Glu Gly Thr Asp Tyr Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn
145 150 155 160

Val Arg Glu Tyr Val Leu Phe Arg Asp Gly His Val Cys Gln His Cys
165 170 175

Arg Gly Arg Ser Lys Asp Pro Ile Leu Asn Val His His Leu Glu Ser
180 185 190

Arg Lys Thr Gly Gly Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu
195 200 205
Thr Cys His Lys Ala Tyr His Ala Gly Lys Ile Lys Leu Lys Thr Arg
210 215 220
Arg Gly Thr Ser Phe Arg Ala Glu Ala Phe Met Gly Ile Met Arg Arg
225 230 235 240
Thr Leu Leu Asp Arg Val Arg Lys Ala His Pro Glu Leu Ser Val Glu
245 250 255

Asn Thr Tyr Gly Tyr Leu Thr Lys His Lys Arg Ile Ala Leu Gly Leu
260 265 270
Pro Lys Thr His Cys Ala Asp Ala Phe Cys Ile Ala Gly Asn Leu Asn
275 280 285
Ala Leu Arg Arg Gly Asp Phe Leu Tyr Gln Arg Gln Thr Arg Lys His
290 295 300
Asn Arg Gln Ile His Lys Cys Ser Ile Leu Lys Gly Gly Val Arg Lys
305 310 315 320

Leu His Gln Ala Pro Phe Leu Val Lys Gly Phe Cys Leu Phe Asp Lys
325 330 335
Val Lys Cys Thr Gly Arg Ile Gly Ile Ile Phe Gly Arg Arg Ser Thr
340 345 350
Gly Ser Phe Asp Val Arg Thr Leu Asp Gly Thr Arg Leu Ser Ala Gly
355 360 365
Ile Ser Ser Lys Lys Leu Thr Leu Leu Glu Lys Arg Thr Thr Phe Leu
370 375 380

Thr Gln Leu Arg Lys
385

<210> 518
<211> 290
<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-451 effector

<400> 518

Met Arg Gly Lys Pro Leu Met Pro Cys Ser Pro Ala Lys Ala Arg His
1 5 10 15

Met Leu Lys Ala Gly Lys Ala Val Val Val Arg Arg Thr Pro Phe Thr
20 25 30

Ile Lys Leu Thr Ile Ala Thr Gly Glu Thr Lys Gln Asp Val Thr Leu
35 40 45

Gly Val Asp Ala Gly Ala Arg His Val Gly Ile Ser Ala Thr Thr Glu
50 55 60

Lys Glu Glu Val Phe Ala Ser Glu Val Ala Leu Arg Gln Asp Ile Thr
65 70 75 80

Gly Leu Leu Ala Asp Arg Leu Ala Phe Arg Arg Ala Arg Arg Asn Arg
85 90 95

Lys Thr Arg Tyr Arg Ala Pro Arg Phe Asn Asn Arg Val Arg Ser Lys
100 105 110

His Lys Gly Trp Leu Ala Pro Ser Val Glu Asn Arg Ile Gln Ala His
115 120 125

Met Ser Arg Ile Asp Ala Val Cys Arg Leu Leu Pro Val Thr Lys Ile
130 135 140

Val Ile Glu Thr Ala Ser Phe Asp Val Gln Lys Ile Lys Asn Pro Thr
145 150 155 160

Ile Glu Gly Thr Gly Tyr Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn
165 170 175

Val Arg Glu Tyr Val Leu Phe Arg Asp Gly His Ile Cys Gln His Cys
180 185 190

Arg Gly Arg Ser Lys Asp Pro Ile Leu Asn Val His His Leu Glu Ser
195 200 205

Arg Lys Thr Gly Gly Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu
210 215 220

Thr Cys His Lys Ala Tyr His Ala Gly Lys Ile Lys Leu Lys Val Lys
225 230 235 240
Arg Gly Gln Ser Phe Arg Ala Glu Ala Phe Met Gly Ile Met Arg Trp
245 250 255
Thr Leu Leu Asp Arg Val Arg Lys Thr Tyr Pro Lys Leu Ala Val Glu
260 265 270
Asn Thr Tyr Gly Tyr Leu Thr Lys His Lys Arg Ile Ala Leu Val Thr
275 280 285

Ser Thr
290

<210> 519
<211> 415
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-452 effector
<400> 519
Met Pro Cys Ser Pro Ala Lys Ala Arg His Leu Leu Lys Ala Gly Lys
1 5 10 15
Ala Ala Val Arg Arg Arg Thr Pro Phe Thr Ile Gln Leu Arg Ile Ala
20 25 30
Thr Gly Glu Thr Lys Gln Ser Val Thr Leu Gly Val Asp Ala Gly Ala

35 40 45
Lys His Val Gly Leu Ser Ala Ala Thr Glu Lys Glu Glu Val Phe Ala
50 55 60
Ser Glu Val Glu Leu Arg Gln Asp Ile Thr Gly Leu Leu Ala Ala Arg
65 70 75 80
Leu Leu Leu Arg Arg Glu Arg Arg Gln Arg Lys Thr Arg Tyr Arg Ala

85 90 95

Pro Arg Phe Leu Asn Arg Val Arg Ser Lys His Lys Gly Trp Leu Ala

100 105 110

Pro Ser Val Glu Asn Arg Ile Gln Ala His Met Ser Arg Ile Asp Ala

115 120 125

Val Cys Arg Leu Leu Pro Val Thr Lys Ile Val Ile Glu Thr Ala Ser

130 135 140

Phe Asp Ile Gln Lys Ile Lys Asp Pro Ser Val Glu Gly Thr Asp Tyr

145 150 155 160

Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn Val Arg Glu Tyr Val Leu

165 170 175

Phe Arg Asp Gly His Val Cys Gln His Cys His Gly Arg Ser Lys Asp

180 185 190

Lys Ile Leu Asn Val His His Leu Glu Ser Arg Gln Thr Gly Gly Asp

195 200 205

Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu Thr Cys His Lys Ala Tyr

210 215 220

His Ala Gly Lys Ile Lys Leu Lys Val Lys Arg Gly Gln Ser Phe Arg

225 230 235 240

Ala Glu Ala Phe Met Gly Ile Met Arg Trp Thr Leu Leu Asp Arg Val

245 250 255

Arg Lys Ala His Pro Gly Leu Pro Val Glu Asn Thr Cys Gly Tyr Leu

260 265 270

Thr Lys Asn Thr Arg Ile Thr Pro Gly Leu Pro Lys Ala His Cys Val

275 280 285

Asp Ala Cys Cys Ile Ala Gly Asn Leu Lys Ala Val Arg Arg Gly Val

290 295 300

Cys Leu His Gln Arg Gln Met Arg Lys His Asn Arg Gln Ile His Lys

305 310 315 320

Cys Thr Ile Leu Leu Gln Thr Leu Glu Asp Gly Thr Lys Ile Gly Tyr

325 330 335

Arg Lys Leu Asn Gln Thr Pro His Met Val Lys Asn Phe Arg Leu Phe
340 345 350
Asp Lys Val Arg Cys Leu Gly Gln Thr Gly Phe Ile Phe Gly Arg Arg

355 360 365
Ser Ser Gly Tyr Phe Asp Val Arg Arg Leu Asp Gly Val Lys Ile Ser
370 375 380
Ser Cys Ile Ser Tyr Arg Lys Leu Thr Leu Leu Glu Lys Arg Ser Thr
385 390 395 400
Cys Leu Thr Glu Leu Arg Lys Glu Asp Gly Ala Ser Ser Pro Val
405 410 415

<210> 520
<211> 405
<212> PRT
<213> Unknown
<220>
<223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-453 effector
<400> 520
Met Arg Gly Lys Pro Leu Met Pro Cys Ser Pro Ala Lys Ala Arg His
1 5 10 15
Met Leu Lys Ala Gly Lys Ala Val Val Ala Arg Arg Thr Pro Phe Thr
20 25 30
Val Lys Leu Thr Ile Ala Thr Gly Glu Thr Lys Gln Asp Val Thr Leu
35 40 45

Gly Val Asp Ala Gly Ala Lys His Val Gly Ile Ser Ala Thr Thr Glu
50 55 60
Lys Glu Glu Val Phe Ala Ser Glu Val Glu Leu Arg Gln Asp Ile Thr
65 70 75 80
Gly Leu Leu Ala Asp Arg Leu Ala Phe Arg Arg Ser Arg Arg Asn Arg
85 90 95
Lys Thr Arg Tyr Arg Val Pro Arg Phe Asn Asn Arg Val Arg Ser Lys

100 105 110

His Lys Gly Trp Leu Ala Pro Ser Val Glu Asn Arg Ile Gln Ala His
115 120 125
Ile Ser Arg Ile Glu Ala Val Cys Arg Val Leu Pro Ile Thr Lys Ile
130 135 140
Val Ile Glu Thr Ala Ser Phe Asp Ile Gln Lys Ile Lys Asp Pro Glu
145 150 155 160
Val Glu Gly Thr Asp Tyr Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn
165 170 175

Val Arg Glu Tyr Val Leu Phe Arg Asp Val His Val Cys Gln His Cys
180 185 190
Arg Gly Arg Ser Lys Asp Pro Ile Leu Asn Val His His Leu Glu Ser
195 200 205
Arg Lys Thr Gly Gly Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu
210 215 220
Thr Cys His Lys Ala Tyr His Ala Gly Lys Ile Lys Leu Lys Thr Arg
225 230 235 240

Arg Gly Thr Ser Phe Arg Ala Glu Ala Phe Met Gly Ile Met Arg Arg
245 250 255
Thr Leu Leu Asp Arg Val Arg Lys Ala His Pro Glu Leu Ser Val Glu
260 265 270
Asn Thr Tyr Gly Tyr Leu Thr Lys His Lys Arg Ile Ala Leu Gly Leu
275 280 285
Pro Lys Thr His Cys Ala Asp Ala Phe Cys Ile Ala Gly Asn Leu Asn
290 295 300

Ala Leu Arg Arg Gly Asp Phe Leu Tyr Gln Arg Gln Thr Arg Lys His
305 310 315 320
Asn Arg Gln Ile His Lys Cys Ser Ile Leu Lys Gly Gly Val Arg Lys
325 330 335
Leu His Gln Ala Pro Phe Leu Val Lys Gly Phe Arg Leu Phe Asp Lys
340 345 350

Val Lys Cys Thr Gly Arg Ile Gly Ile Ile Phe Gly Arg Arg Ser Thr
355 360 365

Gly Ser Phe Asp Val Arg Thr Leu Asp Gly Thr Arg Leu Ser Ala Gly
370 375 380
Ile Ser Ser Lys Lys Leu Thr Leu Leu Glu Lys Arg Thr Thr Phe Leu
385 390 395 400
Thr Gln Leu Arg Lys
405

<210> 521
<211> 406
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-454 effector
<400
> 521
Met Arg Gly Lys Pro Leu Met Pro Cys Ser Pro Ala Lys Ala Arg His
1 5 10 15
Met Leu Lys Ala Gly Lys Ala Val Val Val Arg Arg Thr Pro Phe Thr
20 25 30
Ile Lys Leu Thr Ile Ala Thr Gly Glu Thr Lys Gln Asp Val Thr Leu
35 40 45
Gly Val Asp Ala Gly Ala Arg His Val Gly Ile Ser Ala Thr Thr Glu
50 55 60

Lys Glu Glu Val Phe Ala Ser Glu Val Ala Leu Arg Gln Asp Ile Thr
65 70 75 80
Gly Leu Leu Ala Asp Arg Leu Ala Phe Arg Arg Ala Arg Arg Asn Arg
85 90 95
Lys Thr Arg Tyr Arg Ala Pro Arg Phe Asn Asn Arg Val Arg Ser Lys
100 105 110
His Lys Gly Trp Leu Ala Pro Ser Val Glu Asn Arg Ile Gln Ala His

115 120 125

Met Ser Arg Ile Asp Ala Val Cys Arg Leu Leu Pro Val Thr Lys Ile
130 135 140
Val Ile Glu Thr Ala Ser Phe Asp Val Gln Lys Ile Lys Asn Pro Thr
145 150 155 160
Ile Glu Gly Thr Asp Tyr Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn
165 170 175
Val Arg Glu Tyr Val Leu Phe Arg Asp Gly His Val Cys Gln His Cys
180 185 190

His Gly Arg Ser Arg Asp Lys Ile Leu Asn Val His His Leu Glu Ser
195 200 205
Arg Lys Thr Gly Gly Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu
210 215 220
Thr Cys His Lys Ala Tyr His Ala Gly Lys Ile Lys Leu Lys Val Lys
225 230 235 240
Arg Gly Gln Ser Phe Arg Ala Glu Ala Phe Met Gly Ile Met Arg Trp
245 250 255

Thr Leu Leu Asp Arg Val Arg Lys Thr His Pro Lys Leu Pro Val Glu
260 265 270
Asn Thr Tyr Gly Tyr Leu Thr Lys His Lys Arg Ile Ala Leu Gly Leu
275 280 285
Pro Lys Thr His Cys Ala Asp Ala Phe Cys Ile Ala Gly Asn Leu Lys
290 295 300
Ala Leu Arg Arg Gly Asp Phe Leu Phe Gln Gln Gln Thr Arg Lys His
305 310 315 320

Asn Arg Gln Ile His Arg Cys Ser Ile Leu Lys Gly Gly Val Arg Lys
325 330 335
Leu Asn Gln Ala Pro Phe Leu Val Lys Gly Phe Arg Leu Phe Asp Lys
340 345 350
Val Arg Ile Gly Gly Gln Ile Gly Phe Val Phe Gly Arg Arg Val Arg
355 360 365

Gly Ile Phe Asn Ile Arg Arg Leu Asp Lys Thr Val Ile Gly Thr Asp
370 375 380

Ile Asn Cys Lys Lys Leu Ser Leu Leu Glu Thr Arg Lys Thr Phe Leu
385 390 395 400
Thr Glu Leu Arg Lys Glu
405

<210> 522
<211> 390
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-455 effector
<400> 522
Met Arg Gly Lys Pro Leu Met Pro Cys Ser Pro Ala Lys Ala Arg His
1 5 10 15

Met Leu Lys Ala Gly Lys Ala Val Val Val Arg Arg Thr Pro Phe Thr
20 25 30
Ile Lys Leu Thr Ile Ala Thr Gly Glu Thr Lys Gln Asp Val Thr Leu
35 40 45
Gly Val Asp Ala Gly Ala Arg His Val Gly Ile Ser Ala Thr Thr Glu
50 55 60
Lys Glu Glu Val Phe Ala Ser Glu Val Ala Leu Arg Gln Asp Ile Thr
65 70 75 80

Gly Leu Leu Ala Asp Arg Leu Ala Phe Arg Arg Ala Arg Arg Asn Arg
85 90 95
Lys Thr Arg Tyr Arg Ala Pro Arg Phe Asn Asn Arg Val Arg Ser Lys
100 105 110
His Lys Gly Trp Leu Ala Ser Ser Val Glu Asn Arg Ile Gln Ala His
115 120 125
Met Ser Arg Ile Asp Ala Val Cys Arg Leu Leu Pro Val Thr Lys Ile

130 135 140

Val Ile Glu Ala Ala Ser Phe Asp Val Gln Lys Ile Lys Asn Pro Thr
145 150 155 160
Ile Glu Gly Thr Asp Tyr Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn
165 170 175
Val Arg Glu Tyr Val Leu Phe Arg Asp Gly His Val Cys Gln His Cys
180 185 190
His Gly Arg Ser Arg Asp Lys Ile Leu Asn Val His His Leu Glu Ser
195 200 205

Arg Lys Thr Gly Gly Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu
210 215 220
Thr Cys His Lys Ala Tyr His Ala Gly Lys Ile Lys Leu Lys Val Lys
225 230 235 240
Arg Gly Gln Ser Phe Arg Ala Glu Ala Phe Met Gly Ile Met Arg Trp
245 250 255
Thr Leu Leu Asp Arg Val Arg Lys Thr His Pro Lys Leu Pro Val Glu
260 265 270

Asn Thr Tyr Gly Tyr Leu Thr Lys His Lys Arg Ile Ala Leu Gly Leu
275 280 285
Pro Lys Thr His Cys Ala Asp Ala Phe Cys Ile Ala Gly Asn Leu Lys
290 295 300
Ala Leu Arg Arg Gly Asp Phe Leu Phe Gln Gln Gln Thr Arg Lys His
305 310 315 320
Asn Arg Gln Ile His Arg Cys Ser Ile Leu Lys Gly Gly Val Arg Lys
325 330 335

Leu Asn Gln Ala Pro Phe Leu Val Lys Gly Phe Arg Leu Phe Asp Lys
340 345 350
Val Arg Ile Gly Gly Gln Ile Gly Phe Val Phe Gly Arg Arg Val Arg
355 360 365
Gly Ile Phe Asn Ile Arg Arg Leu Asp Lys Thr Val Ile Gly Lys Asp
370 375 380

Ile Asn Cys Lys Lys Asn

385 390

<210> 523

<211> 406

<212> PRT

<213> Unknown

<220><223>

Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-456 effector

<400> 523

Met Arg Gly Lys Pro Leu Met Pro Cys Ser Pro Ala Lys Ala Arg His

1 5 10 15

Met Leu Lys Ala Gly Lys Ala Phe Val Val Arg Arg Thr Pro Phe Thr

20 25 30

Ile Lys Leu Thr Ile Ala Thr Gly Glu Thr Lys Gln Asp Val Thr Leu

35 40 45

Gly Val Asp Ala Gly Ala Arg His Val Gly Ile Ser Ala Thr Thr Glu

50 55 60

Lys Glu Glu Val Phe Ala Ser Glu Val Ala Leu Arg Gln Asp Ile Thr

65 70 75 80

Gly Leu Leu Ala Asp Arg Leu Ala Phe Arg Arg Ala Arg Arg Asn Arg

85 90 95

Lys Thr Arg Tyr Arg Ser Pro Arg Phe Asn Asn Arg Val Arg Ser Lys

100 105 110

His Lys Gly Trp Leu Ala Ser Ser Val Glu Asn Arg Ile Gln Ala His

115 120 125

Met Ser Arg Ile Asp Ala Val Cys Arg Leu Leu Pro Val Thr Lys Ile

130 135 140

Val Ile Glu Ala Ala Ser Phe Asp Val Gln Lys Ile Lys Asn Pro Thr

145 150 155 160

Ile Glu Gly Thr Asp Tyr Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn

165 170 175

Val Arg Glu Tyr Val Leu Phe Arg Asp Gly His Ile Cys Gln His Cys
180 185 190
Arg Gly Arg Ser Lys Asp Pro Ile Leu Asn Val His His Leu Glu Ser
195 200 205
Arg Lys Thr Gly Gly Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu
210 215 220
Thr Cys His Lys Ala Tyr His Ala Gly Lys Ile Lys Leu Lys Val Lys
225 230 235 240

Arg Gly Gln Ser Phe Arg Ala Glu Ala Phe Met Gly Ile Met Arg Trp
245 250 255
Thr Leu Leu Asp Arg Val Arg Lys Thr His Pro Lys Leu Pro Val Glu
260 265 270
Asn Thr Tyr Gly Tyr Leu Thr Lys His Lys Arg Ile Ala Leu Gly Leu
275 280 285
Pro Lys Thr His Cys Ala Asp Ala Phe Cys Ile Ala Gly Asn Leu Lys
290 295 300

Ala Leu Arg Arg Gly Asp Phe Leu Phe Gln Gln Gln Thr Arg Lys His
305 310 315 320
Asn Arg Gln Ile His Arg Cys Ser Ile Leu Lys Gly Gly Val Arg Lys
325 330 335
Leu Asn Gln Ala Pro Phe Leu Val Lys Gly Phe Arg Leu Phe Asp Lys
340 345 350
Val Arg Ile Gly Gly Gln Ile Gly Phe Val Phe Gly Arg Arg Val Arg
355 360 365

Gly Thr Phe Asn Ile Arg Arg Leu Asp Lys Thr Val Ile Gly Thr Asp
370 375 380
Ile Asn Cys Lys Lys Leu Ser Leu Leu Glu Thr Arg Lys Thr Phe Leu
385 390 395 400
Thr Glu Leu Arg Lys Glu
405

<210> 524

<211> 432

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-457 effector

<400> 524

Met Leu Thr Gly Leu Leu Ala Glu Gln Val Asp Pro Ala Gly Ile Arg
1 5 10 15

Lys Gly Asp Thr Leu Lys Val Phe Val Leu Asn Met Arg Gly Lys Pro
20 25 30

Leu Met Pro Cys Ser Pro Ala Lys Ala Arg His Met Leu Lys Ala Gly
35 40 45

Lys Ala Val Val Ala Arg Arg Thr Pro Phe Thr Ile Lys Leu Thr Ile
50 55 60

Ala Thr Gly Glu Thr Lys Gln Asp Val Thr Leu Gly Val Asp Ala Val
65 70 75 80

Ala Lys His Val Gly Ile Ser Ala Thr Thr Glu Lys Glu Glu Val Phe
85 90 95

Ala Ser Glu Val Glu Leu Arg Gln Asp Ile Thr Gly Leu Leu Ala Asp
100 105 110

Arg Leu Ala Phe Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg
115 120 125

Ala Pro Arg Phe Asn Asn Arg Val Arg Ser Lys His Lys Gly Trp Leu
130 135 140

Ala Pro Ser Val Glu Asn Arg Ile Gln Ala His Ile Ser Arg Ile Glu
145 150 155 160

Ala Ile Cys Arg Val Leu Pro Ile Thr Lys Ile Val Ile Glu Thr Ala
165 170 175

Ser Phe Asp Ile Gln Lys Ile Lys Asn Pro Glu Val Glu Gly Thr Asp

180 185 190

Tyr Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn Val Arg Glu Tyr Val
195 200 205
Leu Phe Arg Asp Gly His Val Cys Gln His Cys Arg Gly Arg Ser Lys
210 215 220
Asp Pro Ile Leu Asn Val His His Leu Glu Ser Arg Lys Thr Gly Gly
225 230 235 240
Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu Thr Cys His Lys Ala
245 250 255

Tyr His Ala Gly Lys Ile Lys Leu Lys Thr Arg Arg Gly Thr Ser Phe
260 265 270
Arg Ala Glu Ala Phe Met Gly Ile Met Arg Arg Thr Leu Leu Asp Arg
275 280 285
Val Arg Lys Ala His Pro Glu Leu Ser Val Glu Asn Thr Tyr Gly Tyr
290 295 300
Leu Thr Lys His Lys Arg Ile Ala Leu Gly Leu Pro Lys Thr His Cys
305 310 315 320

Ala Asp Ala Phe Cys Ile Ala Gly Asn Leu Asn Ala Leu Arg Arg Gly
325 330 335
Asp Phe Leu Tyr Gln Arg Gln Thr Arg Lys His Asn Arg Gln Ile His
340 345 350
Lys Cys Ser Ile Leu Lys Gly Gly Val Arg Lys Leu His Gln Ala Pro
355 360 365
Phe Leu Val Lys Gly Phe Arg Leu Phe Asp Lys Val Lys Cys Thr Gly
370 375 380

Arg Ile Gly Ile Ile Phe Gly Arg Arg Ser Thr Gly Ser Phe Asp Val
385 390 395 400
Arg Thr Leu Asp Gly Thr Arg Leu Ser Ala Gly Ile Ser Ser Lys Lys
405 410 415
Leu Thr Leu Leu Glu Lys Arg Thr Thr Phe Leu Thr Gln Leu Arg Lys
420 425 430

<210> 525

<211> 460

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-458 effector

<400> 525

Met Val Val Tyr Val Leu Asn Lys Asn Asn Lys Pro Leu Met Pro Cys
1 5 10 15

Lys Pro Gln Arg Ala Arg Lys Leu Ile Lys Glu Lys Lys Ala Lys Ile
20 25 30

Val Asn Tyr Lys Pro Phe Thr Ile Lys Leu Ile Tyr Gly Ser Tyr Gly
35 40 45

Tyr Thr Gln Asn Thr Asn Leu Gly Val Asp Leu Gly Ser Lys Asn Ile
50 55 60

Gly Ile Ala Val Thr Thr Gln Asn Lys Val Leu Ala Lys Gly Glu Ile
65 70 75 80

Glu Leu Arg Gln Asp Val Ser Ser Leu Ile Glu Thr Lys Lys Ile Leu
85 90 95

Arg Arg Gly Arg Arg Ser Arg Lys Thr Arg Tyr Arg Arg Cys Lys Phe
100 105 110

Asn Phe Arg Asn Lys Arg Val Phe Asn Ala Pro Lys Gly Ala Lys Leu
115 120 125

Lys Thr Leu Lys Lys Gly Ser Asp Ser Lys Lys Asn Trp Arg Thr Leu
130 135 140

Ser Thr Asn Ile Asp Ser Asn Arg Pro Val Gly Trp Leu Pro Pro Ser
145 150 155 160

Ile Gln Ser Lys Ile Asp Asn Thr Phe Phe Trp Ile Asp Lys Tyr Tyr
165 170 175

Asn Leu Leu Pro Lys Cys Asn Leu Ser Ile Glu Val Gly Lys Phe Asp

180 185 190

Met Ala Lys Met Ile Asn Pro Glu Ile Glu Gly Ala Asp Tyr Gln Gln

195 200 205

Gly Glu Ala Phe Gly Phe Tyr Asn Thr Arg Tyr Phe Val Phe Ala Arg

210 215 220

Asp Asn Tyr Thr Cys Gln Val Cys Lys Lys Asn Lys Asp Lys Val Leu

225 230 235 240

His Thr His His Val Ile Tyr Lys Ser Lys Gly Gly Ser Asp Arg Ala

245 250 255

Asp Asn Leu Ala Thr Ile Cys Thr Asp Cys His Thr Ser Glu Asn His

260 265 270

Lys Pro Gly Gly Ile Leu Tyr Glu Trp Met Ile Lys Lys Lys Lys Met

275 280 285

Lys Thr Tyr Lys Glu Pro Pro Phe Met Asn Ser Met Arg Val Lys Val

290 295 300

Phe Lys Lys Tyr Pro Gln Ala Asn Ile Thr Tyr Gly Ser Ile Thr Thr

305 310 315 320

Pro Arg Arg Lys Glu Leu Gly Leu Glu Lys Thr His Tyr Asn Asp Ala

325 330 335

Ile Ala Ile Ser Lys Val Glu Cys Ile Asn Gln Asn Cys Asp Glu Val

340 345 350

Phe Lys Ile Lys Gln Phe Arg Lys Lys Lys Arg Ser Leu His Glu Ala

355 360 365

Thr Ala Arg Lys Gly Arg Lys Thr Lys Asn Thr Glu Ser Lys Arg Asn

370 375 380

Glu Lys Asn Thr Ser Phe Ala Asn Gly Phe Tyr Leu Asn Asp Lys Val

385 390 395 400

Glu Ile Phe Gly Gln Ile Gly Tyr Ile Thr Gly Phe Ser Gly Lys Ser

405 410 415

Ser Ala Tyr Val Lys Asn Ile Asn Asp Glu Tyr Ile Thr Ile Pro Gly

420 425 430

Lys Lys Tyr Lys Gln Val Ser Ile Ser Ala Leu Lys Phe Ile Asn His

435 440 445

Asn Asn Asn Trp Gln Tyr Glu Ser Asn Phe Ala Ile

450 455 460

<210> 526

<211> 413

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-459 effector

<400> 526

Met Arg Gly Lys Pro Leu Met Pro Cys Ser Pro Ala Lys Ala Arg His

1 5 10 15

Met Leu Lys Ala Gly Lys Ala Phe Val Val Arg Arg Thr Pro Phe Thr

20 25 30

Ile Lys Leu Thr Ile Ala Thr Gly Glu Thr Lys Gln Asp Val Thr Leu

35 40 45

Gly Val Asp Ala Gly Ala Arg His Val Gly Ile Ser Ala Thr Thr Glu

50 55 60

Lys Glu Glu Val Phe Ala Ser Glu Val Ala Leu Arg Gln Asp Ile Thr

65 70 75 80

Gly Leu Leu Ala Asp Arg Leu Ala Phe Arg Arg Ala Arg Arg Asn Arg

85 90 95

Lys Thr Arg Tyr Arg Ala Pro Arg Phe Asn Asn Arg Val Arg Ser Lys

100 105 110

His Lys Gly Trp Leu Ala Pro Ser Val Glu Asn Arg Ile Gln Ala His

115 120 125

Met Ser Arg Ile Asp Ala Val Cys Arg Leu Leu Pro Val Thr Lys Ile

130 135 140

Val Ile Glu Thr Ala Ser Phe Asp Val Gln Lys Ile Lys Asn Pro Thr
145 150 155 160
Ile Glu Gly Thr Asp Tyr Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn
165 170 175
Val Arg Glu Tyr Val Leu Phe Arg Asp Gly His Val Cys Gln His Cys
180 185 190
His Gly Arg Ser Arg Asp Lys Ile Leu Asn Val His His Leu Glu Ser
195 200 205

Arg Lys Thr Gly Gly Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu
210 215 220
Thr Cys His Lys Ala Tyr His Ala Gly Lys Ile Lys Leu Lys Val Lys
225 230 235 240
Arg Gly Gln Ser Phe Arg Ala Glu Ala Phe Met Gly Ile Met Arg Trp
245 250 255
Thr Leu Leu Asp Arg Val Arg Lys Thr His Pro Lys Leu Pro Val Glu
260 265 270

Asn Thr Tyr Gly Tyr Leu Thr Lys His Lys Arg Ile Ala Leu Gly Leu
275 280 285
Pro Lys Thr His Cys Ala Asp Ala Phe Cys Ile Ala Gly Asn Leu Lys
290 295 300
Ala Leu Arg Arg Gly Asp Phe Leu Phe Gln Gln Gln Thr Arg Lys His
305 310 315 320
Asn Arg Gln Ile His Lys Cys Ser Ile Leu Lys Gly Gly Val Arg Lys
325 330 335

Leu Asn Gln Thr Pro Phe Leu Val Lys Gly Phe Arg Leu Phe Asp Lys
340 345 350
Val Lys Cys Lys Gly Arg Ile Gly Phe Ile Phe Gly Arg Arg Ser Phe
355 360 365
Gly Tyr Phe Asp Val Arg Thr Leu Asp Gly Val Arg Leu Ser Ala Gly
370 375 380

Val Ser Phe Lys Lys Leu Met Leu Val Glu Lys Arg Thr Thr Phe Leu
385 390 395 400

Thr Gln Leu Arg Lys Glu Cys Gly Ala Ser Ser Pro Ser
405 410

<210> 527

<211> 427

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-460 effector

<400> 527

Met Val Val Tyr Val Leu Asn Lys His Gly Arg Pro Leu Met Pro Cys
1 5 10 15

Ser Pro Cys Lys Ala Arg Lys Leu Leu Lys Gln Gly Lys Ala Lys Val
20 25 30

Lys Arg Thr Glu Pro Phe Thr Ile Gln Leu Leu Tyr Gly Ser Ser Gly
35 40 45

Tyr Thr Gln Asp Ile Thr Leu Gly Ile Asp Ala Gly Ser Lys His Ile
50 55 60

Gly Val Ser Ala Thr Thr Lys Lys Lys Glu Leu Tyr Ala Ala Asp Val
65 70 75 80

Glu Ile Arg Asn Asp Ile Val Asp Lys Leu Ser Thr Arg Arg Gln Tyr
85 90 95

Arg Arg Glu Arg Arg Asn Arg Lys Thr Arg Tyr Arg Lys Pro Lys Phe
100 105 110

Gln Asn Arg Thr Lys Ser Lys His Lys Gly Trp Leu Ala Pro Ser Ile
115 120 125

Glu Ser Lys Ile Asn Ser His Phe Arg Val Val Lys Asp Val Tyr Lys
130 135 140

Ile Leu Pro Val Ser Arg Ile Val Val Glu Val Ala Ser Phe Asp Ile

145 150 155 160

Gln Lys Ile Gln Asn Pro Asp Ile Ser Gly Val Gly Tyr Gln Gln Gly

165 170 175

Asp Gln Leu Gly Phe Asp Asn Val Arg Glu Tyr Val Leu Trp Arg Asp

180 185 190

Gly His Thr Cys Gln Cys Cys Lys Gly Lys Ser Lys Asp Asn Val Leu

195 200 205

Glu Val His His Ile Glu Ser Arg Lys Thr Gly Gly Asn Ser Pro Asn

210 215 220

Asn Leu Ile Thr Leu Cys Arg Thr Cys His Ser Gly Tyr His Lys Gly

225 230 235 240

Thr Val Thr Leu Pro Ser Lys Ile Lys Arg Gly Met Ser Phe Lys Asp

245 250 255

Ser Thr Phe Met Gly Ile Met Arg Trp Thr Phe Tyr Asn Arg Leu Lys

260 265 270

Glu Met Tyr Arg Asn Val His Met Thr Tyr Gly Tyr Ile Thr Lys His

275 280 285

Asn Arg Ile Lys Asn His Leu Pro Lys Glu His Tyr Ile Asp Ala Tyr

290 295 300

Cys Ile Ala Gly Asn Leu Asn Ala Glu Arg Leu Asp Tyr Tyr Tyr His

305 310 315 320

Gln Lys Cys Val Arg Lys Thr Asn Arg Gln Ile Tyr Lys Ala Lys Ile

325 330 335

Leu Lys Gly Gly Lys Lys Lys Leu Asn Gln Ala Pro Lys Tyr Val Lys

340 345 350

Gly Phe Gln Leu Phe Asp Lys Val Lys Cys Asn Gly Lys Leu Tyr Tyr

355 360 365

Ile Phe Ala Arg Arg Ser Ser Gly Tyr Phe Asp Ile Arg Thr Leu Asn

370 375 380

Gly Asp Lys Val Asn Asn Gly Ser Val Ser Tyr Lys Lys Leu Arg Leu

385 390 395 400

Val Glu Thr Ser Arg Asn Val Leu Thr Glu Arg Lys Ser Arg Phe Pro

405 410 415

Leu Thr Thr Lys Ala Thr Ser Leu Gln Thr Ala

420 425

<210> 528

<211> 412

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-461 effector

<400> 528

Met Thr Tyr Val Ile Asn Gln Ala Gly Ala Pro Leu Met Pro Cys Ser

1 5 10 15

Asp Cys Lys Ala Arg His Leu Leu Lys Ser Asn Arg Ala Asp Ile Val

20 25 30

Asp Leu Thr Pro Phe Thr Ile Arg Leu Arg Phe Ala Val Ser Asp Ile

35 40 45

Thr Glu Pro Val Thr Leu Gly Val Asp Ala Gly Tyr Ser His Ile Gly

50 55 60

Leu Ser Ala Ser Thr Glu Asp Arg Val Leu Phe Glu Cys Glu His Thr

65 70 75 80

Thr Arg Gln Asp Ile Val Asn Leu Leu Glu Ala Arg Arg Ser Leu Arg

85 90 95

Arg Ser Arg Arg Asn Arg Arg Thr Arg Tyr Arg Ala Pro Arg Phe Asp

100 105 110

Asn Arg Val His Ser Lys Asn Lys Gly Trp Leu Ala Pro Ser Ile Glu

115 120 125

Ala Arg Ile Gly Glu His Leu Thr Leu Val Ala Phe Val His Ser Ile

130 135 140

Leu Pro Val Thr Glu Thr Val Val Glu Thr Ala Ala Phe Asp Ile Gln

145 150 155 160

Lys Ile Arg Asn Pro Glu Ile Glu Gly Thr Gly Tyr Gln Gln Gly Asp

165 170 175

Gln Met Gly Phe Trp Asn Val Arg Glu Tyr Val Leu Trp Arg Asp Asn

180 185 190

His Lys Cys Arg His Cys Asn Gly Arg Ser Lys Asp Ser Val Leu Glu

195 200 205

Val His His Leu Val Gln Arg Lys Asp Gly Gly Ser Asp Arg Pro Lys

210 215 220

Asn Leu Ile Thr Leu Cys Arg Thr Cys His His Asp Tyr His Glu Gly

225 230 235 240

Lys Phe Ser Leu Asp Lys Pro Asn Arg Gly Phe Arg Ala Glu Thr Phe

245 250 255

Met Gly Val Met Arg Trp Ala Val Tyr Glu Arg Leu Lys Ala Leu Tyr

260 265 270

Gly Asn Val Arg Met Thr Phe Gly Tyr Ile Thr Lys Asn Thr Arg Ile

275 280 285

Thr His Gly Leu Asp Lys Ser His Ala Val Asp Ala Arg Cys Ile Ala

290 295 300

Gly His Pro Asp Ala Gly Ser Asp Lys Phe Val Tyr Gln Ser Arg Lys

305 310 315 320

Val Arg Cys His Asn Arg Gln Ile His Lys Leu Thr Ile Leu Lys Gly

325 330 335

Gly Ile Arg Lys Ala Asn Gln Cys Pro Arg Met Met Phe Gly Phe Gly

340 345 350

Leu Asn Asp Ile Val Lys Ala Asp Gly Arg Leu Gly Tyr Ile His Gly

355 360 365

Arg Arg Ser Ser Gly Ser Phe Asp Val Arg Thr Leu Ser Gly Glu Val

370 375 380

Ile Ser His Gly Ile Ser Tyr Lys Lys Leu Met Leu Val Glu His Gly

385 390 395 400

Lys Ile Tyr Thr Arg Arg Arg Thr Ser Ser Pro Ala

405 410

<210> 529

<211> 411

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-462 effector

<400> 529

Met Val Tyr Val Leu Ser Ile Glu Gly Leu Pro Leu Met Pro Cys Lys

1 5 10 15

Glu Ala Lys Ala Arg His Leu Leu Lys Gln Asn Lys Ala Lys Val Val

20 25 30

Lys Ile Val Pro Phe Thr Ile Gln Leu Leu Phe Glu Cys Asp Asn Ile

35 40 45

Thr Gln His Ile Ser Leu Gly Val Asp Ala Gly Ser Lys His Ile Gly

50 55 60

Leu Ser Ala Thr Thr Glu Lys Lys Val Leu Tyr Glu Ala Asp Val Glu

65 70 75 80

Leu Arg Asn Asp Ile Val Glu Leu Leu Ser Ser Arg Arg Glu Ala Arg

85 90 95

Ser Ala Arg Arg Asn Arg Lys Thr Arg Tyr Arg Lys Ala Arg Phe Asn

100 105 110

Asn Arg Lys Lys Asp Lys Gly Trp Leu Ala Pro Ser Ile Arg Gln Lys

115 120 125

Ile Glu Thr His Met Thr Val Ile Ala Asn Val His Lys Ile Leu Pro

130 135 140

Ile Thr Ser Ile Thr Ala Glu Val Ala Ser Phe Asp Ile Gln Lys Ile

145 150 155 160

Lys Asn Pro Asp Ile Gln Gly Glu Glu Tyr Gln Gln Gly Glu Gln Leu
165 170 175
Gly Phe Trp Asn Val Arg Glu Tyr Val Leu Phe Arg Asp Cys His Thr
180 185 190
Cys Gln Cys Cys Lys Gly Lys Ser Lys Asp Lys Val Leu Asn Val His
195 200 205
His Leu Glu Ser Arg Lys Thr Gly Gly Asp Ala Pro Asn Asn Leu Ile
210 215 220

Thr Leu Cys Glu Thr Cys His Gln Gly Tyr His Lys Gly Thr Val Lys
225 230 235 240
Leu Pro Lys Asn Ile Lys Arg Gly Met Lys Phe Asn Asp Ala Ala Phe
245 250 255
Met Gly Ile Met Arg Trp Ala Phe Tyr Asn Gln Leu Lys Glu Ile Tyr
260 265 270
Pro Asn Val Ser Leu Thr Tyr Gly Tyr Ile Thr Lys Asn Thr Arg Ile
275 280 285

Glu Asn His Leu Pro Lys Glu Lys Cys Thr Asp Ala Arg Cys Ile Ser
290 295 300
Gly His Pro Phe Ala Val Ser Asp Gly Thr Val Ile Leu Ile Lys Lys
305 310 315 320
Val Arg Arg His Asn Arg Lys Leu Tyr Lys Asp Thr Ile Lys Lys Gly
325 330 335
Gly Val Lys Gln Arg Asn Gln Cys Pro His Asn Met Phe Gly Tyr His
340 345 350

Arg Phe Asp Ile Val Lys Trp Asn Gly Lys Ile Cys Tyr Val Asn Ser
355 360 365
Leu Arg Thr Ser Gly Ser Phe Gln Ile Lys Asp Leu Ala Asn Asn Glu
370 375 380
Phe Ser Arg Asn Ile Ile Phe Arg Lys Leu Thr Lys Val Gln His Arg
385 390 395 400

Asp Gly Phe Ile Ala Lys Val Ile Lys Val Ala

405 410

<210> 530

<211> 416

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-463 effector

<400> 530

Met Val Tyr Val Leu Asn Lys Asp Gly Gln Pro Ile Met Pro Thr Gln

1 5 10 15

Asn His Ala Lys Val Arg Val Leu Leu Lys Asn Asn Lys Ala Arg Val

20 25 30

Ile Asn Arg Cys Pro Phe Thr Ile Gln Leu Leu Tyr Glu Cys Asp Asn

35 40 45

Gln Thr Gln Pro Val Ser Leu Gly Ile Asp Ala Gly Ser Lys His Ile

50 55 60

Gly Ile Ser Ala Thr Thr Glu Ser Lys Val Leu Tyr Glu Ala Asp Val

65 70 75 80

Glu Leu Arg Asn Asp Ile Val Asp Leu Leu Ser Thr Arg Arg Glu Ala

85 90 95

Arg Arg Thr Arg Arg Asn Arg Lys Thr Arg Tyr Arg Lys Pro Arg Phe

100 105 110

Asn Asn Arg Val Ser Thr Lys Lys Gln Gly Trp Leu Ala Pro Ser Ile

115 120 125

Lys Gln Lys Ile Gln Ser His Leu Thr Val Val Asp Lys Val Asn Lys

130 135 140

Ile Leu Pro Val Ser Lys Thr Thr Val Glu Val Ala Ser Phe Asp Ile

145 150 155 160

Gln Lys Ile Lys Asn Pro Gly Ile Lys Asn Thr Asp Tyr Gln Gln Gly

165 170 175

Glu Gln Leu Gly Phe Trp Asn Ile Arg Glu Tyr Val Met Phe Arg Asp

180 185 190

Gly His Val Cys Gln Cys Cys Lys Gly Lys Ser Lys Asp Lys Ile Leu

195 200 205

Asn Val His His Ile Glu Ser Arg Lys Val Gly Gly Asp Ala Pro Asn

210 215 220

Asn Leu Ile Thr Leu Cys Glu Thr Cys His Thr Gly Tyr His Lys Gly

225 230 235 240

Lys Ile Lys Leu Pro Lys Glu Ile Lys Arg Gly Met Lys Phe Lys Asp

245 250 255

Ala Thr Phe Met Gly Ile Met Arg Trp Ala Phe Tyr Asn Lys Leu Lys

260 265 270

Glu Leu Tyr Pro Asn Val Ser Leu Thr Tyr Gly Tyr Ile Thr Lys Asn

275 280 285

Thr Arg Ile Val Asn Gly Leu Ser Lys Glu His Phe Ile Asp Ala Arg

290 295 300

Cys Ile Ser Gly Asn Pro Asn Ala Ser Ser Asp Gly Ile Val Tyr Tyr

305 310 315 320

Gln Lys Lys Val Arg Cys His Asn Arg Gln Ile His Lys Gln Lys Ile

325 330 335

Leu Lys Gly Gly Ile His Lys Leu Asn Gln Ala Pro Tyr Lys Val Lys

340 345 350

Gly Phe Arg Leu Phe Asp Lys Val Gln Tyr Gln Gly Asn Asp Tyr Phe

355 360 365

Ile Phe Gly Arg Arg Ser Asn Gly Phe Phe Asp Ile Arg Thr Leu Asp

370 375 380

Gly Ile Lys Val Asn Lys Gly Ser Leu Ser Tyr Lys Lys Ile Thr Leu

385 390 395 400

Leu Glu Met Ser Gln Ser Phe Leu Thr Glu Gln Arg Lys Val Ile Ala

405 410 415

<210> 531

<211> 437

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-464 effector

<400> 531

Met Val Tyr Val Leu Asp Lys Asn Gly His Ser Leu Met Pro Thr Asn
1 5 10 15

Arg His Gly Lys Val Arg Arg Met Leu Lys Ser Gly Asn Val Lys Val
20 25 30

Ile Arg Arg Cys Pro Phe Thr Ile Gln Leu Leu Tyr Asp Ser Thr Asp
35 40 45

Tyr Thr Gln Pro Val Ser Leu Gly Ile Asp Ala Gly Ser Arg His Val
50 55 60

Gly Val Ser Ala Thr Thr Glu Thr Lys Val Leu Tyr Glu Ala Asp Val
65 70 75 80

Thr Leu Arg Asn Asp Ile Val Asp Leu Leu Ser Thr Arg Arg Glu Thr
85 90 95

Arg Arg Ala Arg Arg Asn Arg Lys Thr Arg Tyr Arg Lys Pro Arg Phe
100 105 110

Asn Asn Arg Thr Arg Lys Asp Gly Trp Leu Ala Pro Ser Val Gln Gln
115 120 125

Lys Val Asp Thr His Leu Thr Val Val Arg Lys Ala Thr Glu Ile Leu
130 135 140

Pro Val Ser Ser Ile Thr Val Glu Thr Ala Ser Phe Asp Ile Gln Lys
145 150 155 160

Ile Lys Asn Pro Asp Ile Ser Gly Thr Gly Tyr Gln Gln Gly Glu Gln

165 170 175

Leu Asp Phe Trp Asn Val Arg Glu Tyr Val Leu Phe Arg Asp Gly His
180 185 190
Thr Cys Gln Cys Cys Lys Gly Lys Ser Lys Asp Pro Val Leu Asn Val
195 200 205
His His Ile Glu Ser Arg Lys Thr Gly Gly Asn Ala Pro Asn Asn Leu
210 215 220
Ile Thr Leu Cys Glu Thr Cys His Lys Gly Tyr His Lys Gly Thr Val
225 230 235 240

Thr Leu Pro Lys Ala Ile His Arg Gly Met Lys Phe Lys Asp Ala Ala
245 250 255
Phe Met Gly Ile Met Arg Trp Ala Phe Tyr Asn Arg Val Lys Glu Ile
260 265 270
Tyr Glu Pro Leu Gly Ile Arg Val Asn Met Thr Tyr Gly Tyr Ile Thr
275 280 285
Lys Asn Thr Arg Ile Glu His Asn Leu Pro Lys Asp His Phe Ile Asp
290 295 300

Ala Arg Cys Ile Ser Gly His Pro Asp Ala Val Ser Asp Gly Thr Val
305 310 315 320
Phe Tyr Gln Lys Lys Val Arg Cys His Asn Arg Gln Ile His Lys Gln
325 330 335
Lys Ile Leu Lys Gly Gly Val Arg Lys Arg Asn Gln Ala Pro Tyr Leu
340 345 350
Val Lys Gly Phe Arg Leu Phe Asp Lys Val Thr Ala Lys Ser Arg Glu
355 360 365

Trp Tyr Ile Asn Gly Arg Arg Leu Lys Gly Ser Phe Val Leu Lys Asn
370 375 380
Leu Asp Gly Asp Thr Leu Glu Ile Ala Pro Ser Lys Ile Arg Phe Val
385 390 395 400
Thr Gln Gln His Gly Phe Ile Thr Glu Arg Lys Met Leu Gly Gly Gly
405 410 415

Val Leu Ile Arg Thr Ser Pro Met Thr Lys Val Thr Gly Pro Arg Ala
420 425 430

Arg Leu Phe Tyr Gly
435

<210> 532

<211> 411

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-465 effector

<400> 532

Met Leu Val Tyr Val Leu Asn Lys Tyr Gly Lys Pro Leu Met Pro Cys
1 5 10 15

Ser Pro Gln Lys Ala Arg Lys Leu Leu Lys Asn Lys Lys Ala Lys Val
20 25 30

Val Lys Lys Val Pro Phe Thr Ile Gln Leu Leu Tyr Gly Ser Thr Gly
35 40 45

Tyr Lys Gln Asp Ile Ser Leu Gly Val Asp Ala Gly Ser Lys His Ile
50 55 60

Gly Ile Ser Ala Thr Thr Asn Glu Asp Val Leu Phe Glu Ala Asn Val
65 70 75 80

Glu Leu Arg Asn Asp Ile Val Glu Asn Leu Ser Thr Arg Arg Glu Ala
85 90 95

Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg Lys Pro Arg Phe
100 105 110

Lys Asn Arg Ile Lys Ser Lys Lys Lys Gly Trp Leu Ala Pro Ser Ile
115 120 125

Arg Gln Lys Ile Glu Thr His Leu Glu Val Val Lys Met Ile His Lys
130 135 140

Ile Leu Pro Ile Ser Ile Ile Ile Ala Glu Thr Ala Ser Phe Asp Ile

145 150 155 160

Gln Lys Ile Lys Asn Pro Ala Ile Ser Gly Val Glu Tyr Gln Gln Gly
165 170 175

Asp Gln Leu Asn Phe Trp Asn Val Arg Glu Tyr Val Leu Phe Arg Asp
180 185 190

Asn His Met Cys Gln His Cys Lys Gly Lys Ser Lys Asp Asn Ile Leu
195 200 205

Asn Val His His Ile Glu Ser Arg Lys Thr Gly Gly Asn Ala Pro Ser
210 215 220

Asn Leu Ile Thr Leu Cys Glu Thr Cys His Lys Asn Tyr His Ser Gly
225 230 235 240

Lys Ile Lys Leu Asp Ile Lys Arg Gly Met Ser Phe Lys Asp Ala Ala
245 250 255

Phe Met Gly Ile Met Arg Trp Thr Phe Tyr Glu Lys Leu Lys Glu Ile
260 265 270

Tyr Glu Asn Val Thr Met Thr Phe Gly Tyr Ile Thr Lys Asn Cys Arg
275 280 285

Ile Thr Asn Asn Leu His Lys Asp His Tyr Ile Asp Ala Arg Cys Ile
290 295 300

Ser Gly Asn Pro Arg Ala Lys Ser Cys Gly Thr Val Tyr Tyr Phe Lys
305 310 315 320

Lys Ile Arg Arg His Asn Arg Lys Ile Phe Lys Asp Lys Ile Leu Lys
325 330 335

Gly Asn Thr Lys Lys Arg Asn Lys Cys Ser Tyr Glu Val Phe Gly Phe
340 345 350

Arg Arg Tyr Asp Leu Val Lys Phe Glu Asn Lys Leu Tyr Tyr Ile Asn
355 360 365

Ser Leu Arg Val Arg Gly Cys Phe Gln Ile Lys Asp Leu Phe Asp Lys
370 375 380

Thr Phe Glu Lys Gln Ile Ser Leu Lys Lys Leu Gln Phe Val Gln Met
385 390 395 400

Arg Ser Gly Phe Ile Ser Thr Phe Cys Thr Ile

405 410

<210> 533

<211> 434

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-466 effector

<400> 533

Met Gln Asn Arg Val Phe Val Ile Asn Lys His Gly Glu Ala Leu Met

1 5 10 15

Pro Cys Lys Pro Arg Lys Ala Arg Ile Leu Leu Arg Asn Gly Lys Ala

20 25 30

Lys Val Ile Lys Lys Glu Pro Phe Thr Ile Gln Leu Leu Tyr Gly Ser

35 40 45

Thr Gly Tyr Lys Gln Asp Ile Ser Leu Gly Val Asp Ser Gly Gln Arg

50 55 60

His Ile Gly Ile Ala Val Thr Ser Gln Asn Lys Val Leu Phe Gln Gly

65 70 75 80

Glu Val Glu Leu Arg Gln Asp Val Lys Ser Leu Leu Asp Thr Arg Arg

85 90 95

Ala Tyr Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg Lys Ala

100 105 110

Arg Phe Leu Asn Arg Ile Ala Lys Lys Lys Asn Asn Trp Leu Pro Pro

115 120 125

Ser Val Ala Ser Lys Val Asn His Asn Ile Asn Trp Ile Asn His Leu

130 135 140

Leu Ser Val Leu Pro Lys Ala Asp Leu His Ile Glu Val Gly Lys Phe

145 150 155 160

Asp Ile Gln Lys Met Lys Asn Pro Asn Ile Lys Gly Glu Gly Tyr Gln

165 170 175

Gln Gly Asp Leu Tyr Gly Tyr Gln Thr Val Lys Gln Phe Val Leu Thr

180 185 190

Arg Asp Asn Tyr Thr Cys Gln Val Cys Lys Lys Lys Gly Gly Lys Leu

195 200 205

Lys Ile His His Ile Ile Tyr Arg Ser Leu Gly Gly Thr Asn Thr Val

210 215 220

Asp Asn Leu Ile Thr Val Cys Ala Asn Cys His Thr Thr Lys Asn His

225 230 235 240

Gln Thr Gly Ile Leu Ala Lys Trp Cys Lys Asp Lys Lys Lys Val Asn

245 250 255

Lys Ser Tyr Lys Gly Ala Thr Phe Met Asn Ile Leu Arg Lys Arg Leu

260 265 270

Phe Leu Ala Phe Pro Gln Val Lys Phe Gln Tyr Gly Ala Trp Thr Thr

275 280 285

Leu Gln Arg Thr Asp Leu Lys Leu Ala Lys Ser His Tyr Asn Asp Ala

290 295 300

Val Ala Ile Ser Gly Ile Arg Gln Ile Glu Val Lys Pro Thr Ser Val

305 310 315 320

Val Met Phe Lys Gln Phe Arg Lys Lys Lys Arg Ser Leu His Glu Ala

325 330 335

Thr Ala Arg Lys Gly Arg Lys Leu Pro Asn Val Thr Gly Lys Arg Asn

340 345 350

Ala Lys Asn Thr Lys Tyr Ala Lys Gly Phe Trp Leu Asn Asp Tyr Val

355 360 365

Lys Ile Lys Asp Ser Asn Lys Lys Gly Phe Ile Ser Gly Phe Thr Ser

370 375 380

Lys Gly Ala Ser Val Arg Leu Arg Asn Ile Phe Gly Glu Tyr Val Ser

385 390 395 400

Asn Ser Asp Arg Asn Tyr Thr Ser Thr Lys Lys Leu Ile Leu Ile Asn

405 410 415

His Ser Asn Asn Trp Gln Lys Gln Ile Ile Thr Glu Gln Gln Tyr Val

420 425 430

Met Gly

<210> 534

<211> 428

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-467 effector

<400> 534

Met Gln Arg Val Phe Val Leu Val Ser Asn Lys Gln Pro Leu Met Pro

1 5 10 15

Cys His Pro Ala Arg Ala Arg Lys Leu Leu Arg Lys Glu Lys Ala Ala

20 25 30

Val Tyr Arg Arg Tyr Pro Phe Thr Ile Ile Met Thr His Arg Val Gly

35 40 45

Gly Asp Leu Gln Pro Ile Glu Ile Lys Phe Asp Pro Gly Ser Arg Thr

50 55 60

Thr Gly Val Ala Leu Val Gly His Phe Asn Arg Gly Ser Glu Val Ile

65 70 75 80

Trp Ala Gly Asn Leu Asn His Arg Gly Ala Gln Ile Lys Arg Asn Leu

85 90 95

Asn Ser Arg Arg Ala Ile Arg Ser Ser Arg Arg Asn Arg Lys Thr Arg

100 105 110

Tyr Arg Pro Ala Arg Phe Leu Asn Arg Arg Arg Pro Lys Gly Trp Leu

115 120 125

Pro Pro Ser Leu Arg Ser Arg Val Asp Asn Val Lys Asn Trp Met Leu

130 135 140

Lys Leu Asp Lys Leu Ala Pro Leu Thr Gln Ile Ala Val Glu Thr Val
145 150 155 160

Arg Phe Asp Thr Gln Lys Met Gln Asn Pro Glu Ile Ser Gly Val Glu
165 170 175

Tyr Gln Gln Gly Asp Leu Ala Gly Tyr Glu Leu Arg Glu Tyr Leu Leu
180 185 190

Glu Lys Trp Gly Arg Glu Cys Ala Tyr Cys Gly Ala Lys Asn Val Pro
195 200 205

Leu Glu Ile Glu His Ile Val Ala Arg Ser Lys Gly Gly Ser Asp Arg
210 215 220

Val Ser Asn Leu Thr Leu Ala Cys Thr Pro Cys Asn Ile Asp Lys Gly
225 230 235 240

Asn Lys Asp Ile Lys Asp Phe Leu Lys Arg Lys Gln Lys Arg Leu Lys
245 250 255

Lys Ile Gln Ala Gln Ala Lys Thr Pro Leu Lys Asp Ala Ala Ala Val
260 265 270

Asn Ala Thr Arg Tyr Ala Thr Gly Asn Val Leu Lys Gly Phe Ser Leu
275 280 285

Pro Ile Val Phe Ser Ser Gly Gly Arg Thr Lys Phe Asn Arg Ile Lys
290 295 300

Leu Gly Tyr Lys Lys Asp His Trp Ile Asp Ala Ala Cys Val Gly Glu
305 310 315 320

Ser Gly Ser His Val Ile Ile Pro Gln Ala Ile Thr Pro Leu Ile Ile
325 330 335

Thr Ala Lys Gly Arg Gly Ser Arg Gln Lys Cys Ser Met Asn Gln Tyr
340 345 350

Gly Phe Pro Arg Thr Gly Pro Lys Lys His Lys Arg Val Lys Gly Phe
355 360 365

Gln Thr Gly Asp Leu Val Lys Ala Ile Val Thr Lys Gly Lys Lys Ile
370 375 380

Gly Thr Tyr Val Gly Arg Val Val Val Arg Ala Ser Gly Ser Phe Asp

385 390 395 400

Ile Gly Ser Gly Glu Glu Lys Val Ala Gly Ile Ser Tyr Lys Tyr Cys

405 410 415

Arg Leu Leu Gln Arg Ser Asp Gly Tyr Glu Tyr Thr

420 425

<210> 535

<211> 433

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-468 effector

<400> 535

Met Asn Arg Ile Phe Val Leu Asp Asn Gln Lys Gln Pro Leu Ser Pro

1 5 10 15

Cys Leu Pro Ala Arg Ala Arg Met Leu Leu Arg Glu Gly Lys Ala Ala

20 25 30

Val Tyr Arg Arg Phe Pro Phe Thr Ile Ile Leu Lys Asn Arg Thr Gly

35 40 45

Gly Glu Thr Gln Pro Val Glu Leu Lys Leu Asp Pro Gly Ser Lys Thr

50 55 60

Thr Gly Ile Ala Leu Ile Ala Glu Val Lys Thr Gly Lys Val Ala Val

65 70 75 80

Phe Ala Ala Glu Leu Asn His Arg Gly Ala Ala Ile Lys Lys Val Leu

85 90 95

Leu Asp Arg Arg Met Phe Arg Arg Asn Arg Arg Ala Arg Lys Thr Arg

100 105 110

Tyr Arg Ala Pro Arg Phe Asp Asn Arg Thr Arg Arg Asn Gly Trp Leu

115 120 125

Pro Pro Ser Ile Gln Ser Arg Val Asp Asn Ser Leu Thr Trp Ala Lys

130 135 140

Arg Leu Arg Arg Leu Cys Pro Ile Thr Thr Val Ala Val Glu Thr Ala

145 150 155 160

Arg Phe Asp Met Gln Gln Met Glu Asn Pro Asp Ile Ser Gly Val Glu

165 170 175

Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Leu Arg Glu Tyr Leu Leu

180 185 190

Glu Lys Trp Gly Arg Arg Cys Ala Tyr Cys Gly Ala Glu Asn Val Pro

195 200 205

Leu Glu Ile Glu His Val Val Pro Arg Ser Lys Gly Gly Ser Asn Arg

210 215 220

Glu Ser Asn Leu Thr Leu Ala Cys Arg Asp Cys Asn Glu Lys Lys Gly

225 230 235 240

Asn Gly Pro Ile Arg Glu Phe Leu Ala Thr Lys Pro Glu Leu Leu Lys

245 250 255

Lys Ile Leu Ala Gly Leu Lys Arg Pro Leu His Asp Ala Ala Val Val

260 265 270

Asn Ala Ala Arg Tyr Ala Leu Gly Gly Ala Leu Lys Ser Leu Gly Leu

275 280 285

Pro Val Ser Phe Trp Ser Gly Gly Arg Thr Lys Phe Asn Arg Thr Gly

290 295 300

Gln His Tyr Pro Lys Ala His Trp Ile Asp Ala Ala Cys Val Gly Glu

305 310 315 320

Thr Gly Ala Ala Val Lys Leu Asp Pro Lys Leu Gln Pro Phe Ser Val

325 330 335

Val Ala Ser Gly Arg Gly Ser Arg Gln Met Cys Arg Met Asp Lys Tyr

340 345 350

Gly Phe Pro Arg Thr Gly Pro Lys Gly Ala Arg Phe Val Lys Gly Phe

355 360 365

Arg Thr Gly Asp Leu Val Lys Ala Val Val Pro Ala Gly Lys Lys Thr

370 375 380

Gly Thr His Leu Gly Arg Val Ala Val Arg Ser Thr Gly Ser Phe Asn

385 390 395 400

Val Thr Thr Ala Ala Gly Thr Ile Gln Gly Ile Ser His Lys Tyr Cys

405 410 415

Arg Arg Leu His Arg Ala Asp Gly Tyr Gly Tyr Thr Asn Lys Pro Ser

420 425 430

Ala

<210> 536

<211> 436

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-469 effector

<400> 536

Met Ser Asn Val Leu Val Met Asp Thr Asn Lys Gln Pro Leu Arg Pro

1 5 10 15

Cys His Pro Ala Val Ala Arg Ile Leu Leu Lys His Gly Lys Ala Ala

20 25 30

Val Tyr Arg Gln Phe Pro Phe Thr Ile Ile Leu Lys Tyr Glu Val Thr

35 40 45

Gly Pro Val Glu Pro Leu Arg Leu Lys Ile Asp Pro Gly Ser Lys Thr

50 55 60

Thr Gly Met Ala Ile Val Asp Asp Ala Thr Gly Glu Val Val Trp Ala

65 70 75 80

Ala Glu Ile Glu His Arg Gly Gln Arg Ile Arg Asp Arg Leu Leu Ala

85 90 95

Arg Arg Gln Leu Arg Arg Gly Arg Arg Asn Arg Lys Thr Arg Tyr Arg

100 105 110

Lys Pro Arg Phe Asp Asn Arg Arg Arg Arg Glu Gly Trp Leu Pro Pro

115 120 125

Ser Leu Glu Ser Arg Val Ala Asn Val Glu Thr Trp Val Asn Arg Leu
130 135 140

Arg Arg Trp Cys Ala Leu Gly Asn Leu Ser Tyr Glu Leu Val Arg Phe
145 150 155 160
Asp Thr Gln Gln Leu Gln Asn Pro Glu Val Asn Gly Val Glu Tyr Gln
165 170 175
Gln Gly Glu Leu Leu Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys
180 185 190
Trp Gln Arg Gln Cys Ala Tyr Cys Gly Val Glu Asn Val Pro Leu Glu
195 200 205

Val Glu His Ile Val Pro Lys Ser Arg Gly Gly Ser Asn Arg Val Ser
210 215 220
Asn Leu Thr Leu Ala Cys Val Pro Cys Asn Gly Lys Lys Gly Asn Gln
225 230 235 240
Thr Ala Ala Glu Phe Gly Phe Pro Glu Ile Gln Ala Gln Ala Lys His
245 250 255
Pro Leu Lys Asp Ala Thr Val Val Asn Ala Thr Arg Trp Ala Leu Tyr
260 265 270

Arg Arg Leu Ala Ala Leu Gly Leu Asp Ile Glu Val Gly Thr Gly Gly
275 280 285
Arg Thr Lys Phe Asn Arg Thr Arg Gln Gly Leu Pro Lys Ala His Trp
290 295 300
Leu Asp Ala Ala Cys Val Gly Ala Ser Thr Pro Glu Leu Gln Leu Asn
305 310 315 320
Gly Thr Ser Pro Trp Ala Val Lys Ala Lys Gly Trp Gly Gln Arg Gln
325 330 335

Met Cys Arg Met Asp Arg Tyr Gly Phe Pro Arg Thr Gly Ala Lys Gln
340 345 350
Ala His Arg Val His Gly Phe Ala Thr Gly Asp Leu Val Gln Ala Val
355 360 365
Val Pro Thr Gly Lys Lys Gln Gly Val His Val Gly Arg Val Ala Ile

370 375 380

Arg Thr Gln Gly Thr Phe Arg Val Gly Val Val Asp Gly Ile Asn Trp
385 390 395 400

Arg Tyr Cys Thr Arg Arg Gln Ala Gly Asp Gly Tyr Asp Tyr Thr Lys
405 410 415

Glu Gly Ala Arg Leu Pro Pro Thr Leu Glu Arg Arg Gly Phe Pro Ser
420 425 430

Arg Glu Phe Leu
435

<210> 537

<211> 431

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-470 effector

<400> 537

Met Ser Asn Phe Val Phe Val Leu Asp Thr Asn Lys Arg Gln Leu Asp
1 5 10 15

Pro Val His Pro Gly Lys Ala Arg Arg Leu Leu Ser Thr Gly Asn Ala
20 25 30

Ala Val Phe Arg Arg Tyr Pro Phe Thr Ile Ile Leu Lys Gln Ala Tyr
35 40 45

Pro Glu Ile Pro Val Gln Asp Leu Glu Leu Lys Leu Asp Pro Gly Ser
50 55 60

Gln Val Thr Gly Ile Ala Val Val Gln Gly Thr Lys Val Ile Phe Gly
65 70 75 80

Ala Glu Leu Glu His Arg Gly Gln Gln Ile Lys Asp Ala Leu Leu Ser
85 90 95

Arg Arg Gln Leu Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg
100 105 110

Gln Ala Arg Phe Leu Asn Arg Thr Arg Pro Lys Gly Trp Leu Pro Pro
115 120 125

Ser Leu Gln His Arg Val Asp Thr Thr Met Thr Trp Val Asn Arg Phe
130 135 140
Arg Arg Leu Ala Pro Ile Ala Arg Ile Ala Gln Glu Leu Val Arg Phe
145 150 155 160
Asp Leu Gln Leu Ile Gln Asn Pro Glu Ile Ser Gly Ile Glu Tyr Gln
165 170 175
Gln Gly Glu Leu Gln Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys
180 185 190

Trp Asn Arg Lys Cys Ala Tyr Cys Gly Ala Lys Asn Val Ala Leu Glu
195 200 205
Val Glu His Ile His Pro Lys Ser Lys Gly Gly Thr Asp Arg Val Ser
210 215 220
Asn Leu Thr Leu Ala Cys His Ser Cys Asn Gln Ser Lys Ser Asn Arg
225 230 235 240
Asp Ile Arg Asp Phe Leu Ser Ser Lys Pro Asp Val Leu Asn Arg Ile
245 250 255

Leu Asn Gln Ala Lys Ser Pro Leu Lys Asp Ala Ala Ala Val Asn Ser
260 265 270
Thr Arg Trp Ala Leu Phe Asn Ala Leu Lys Gln Thr Gly Leu Pro Val
275 280 285
Ala Thr Gly Thr Gly Gly Gln Thr Lys Phe Asn Arg Thr Arg Leu Asp
290 295 300
Leu Pro Lys Thr His Trp Leu Asp Ala Ala Ser Val Gly Lys Ile Asp
305 310 315 320

Ser Leu Lys Val Leu Thr Thr Lys Pro Leu Leu Ile Ala Ala Lys Gly
325 330 335
His Gly Thr Arg Gln Met Cys Gly Thr Asp Lys Phe Gly Phe Pro Lys
340 345 350
Arg His Arg Ser Arg Val Gln Ile His Lys Gly Phe Gln Thr Gly Asp

355 360 365

Ile Ile Thr Ala Thr Val Thr Lys Gly Lys Lys Ile Gly Ser Tyr Val

370 375 380

Gly Arg Val Leu Cys Arg Thr Ser Gly Ser Phe Asp Val Thr Thr Gln

385 390 395 400

Ser Gly Arg Val Ser Gly Ile Ser His Arg Tyr Cys Gln Pro Ile His

405 410 415

Lys Arg Asp Gly Tyr Ala Tyr Ala Phe Ala His Thr Ile Gly Asp

420 425 430

<210> 538

<211> 415

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220

><223> Category: MG35 effectors

<220><223> Description: MG35-471 effector

<400> 538

Met Val Tyr Val Val Ala Asn Asp Gly Gln Pro Leu Met Pro Thr Asn

1 5 10 15

Arg Tyr Gly Lys Val Tyr Arg Met Leu Arg Ser Gly Met Ala Val Val

20 25 30

Val Lys Lys Cys Pro Phe Thr Ile Gln Leu Gln Tyr Glu Ser Glu Arg

35 40 45

Asn Val Gln Pro Val Ala Leu Gly Ile Asp Ala Gly Ser Lys His Val

50 55 60

Gly Val Ser Ala Thr Thr Lys Ala Lys Val Leu Tyr Glu Ser Asp Val

65 70 75 80

Glu Leu Arg Gly Asp Ile Val Lys Leu Leu Ala Thr Arg Arg Gln Leu

85 90 95

Arg Arg Ser Arg Arg Ser Arg Lys Thr Arg Tyr Arg Pro Ala Arg Phe

100 105 110

Asp Asn Arg Lys Arg Lys Asn Gly Trp Leu Ala Pro Ser Ile Arg Gln

115 120 125

Lys Ile Glu Ser His Leu Thr Val Val Ala Asn Val Cys Lys Ile Leu

130 135 140

Pro Val Ser Arg Ile Ile Val Glu Thr Ala Ser Phe Asp Ile Gln Lys

145 150 155 160

Ile Lys Asn Pro Asp Ile Gln Gly Thr Glu Tyr Gln Gln Gly Glu Gln

165 170 175

Met Asp Phe Trp Asn Val Arg Glu Tyr Val Phe Phe Arg Asp Gly His

180 185 190

Thr Cys Gln Cys Cys Lys Gly Arg Ser Lys Asp Lys Ile Leu Asn Val

195 200 205

His His Ile Glu Ser Arg Lys Thr Gly Gly Asn Ala Pro Asn Asn Leu

210 215 220

Ile Thr Leu Cys Glu Thr Cys His Lys Gly Tyr His Asn Gly Thr Val

225 230 235 240

Thr Leu Pro Lys Asn Ile Lys Arg Gly Met Lys Phe Lys Asp Ala Ala

245 250 255

Phe Met Gly Ile Met Arg Trp Thr Phe Tyr Asn Thr Leu Lys Glu Gln

260 265 270

Tyr Glu Pro Asp Ile Pro Val His Tyr Thr Tyr Gly Tyr Ile Thr Lys

275 280 285

Asn Thr Arg Ile Asn His Asn Leu Pro Lys Gly His Cys Ile Asp Ala

290 295 300

Arg Cys Ile Ser Gly Asn Pro Asp Ala Val Ser Asp Gly Thr Tyr Tyr

305 310 315 320

Tyr Gln Lys Lys Val Arg Cys His Asn Arg Gln Ile His Lys Gln Thr

325 330 335

Ile Leu Lys Gly Gly Ile Arg Lys Ser Asn Gln Ala Glu Tyr Leu Val

340 345 350

Arg Gly Phe Arg Leu Phe Asp Lys Val Arg Tyr Gln Gly Arg Glu Tyr

355 360 365

Phe Ile Phe Gly Arg Arg Lys Ser Gly Phe Phe Asp Ile Arg Thr Leu

370 375 380

Ser Gly Glu Lys Val Asn Lys Gly Ser Ile Asn Val Lys Arg Leu Thr

385 390 395 400

Phe Val Asp Thr Arg Lys Asn Tyr Leu Thr Glu Arg Arg Thr Val

405 410 415

<210> 539

<211> 428

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-472 effector

<400> 539

Met Asn Arg Val Phe Val Leu Ser Arg Thr Arg Thr Pro Leu Met Pro

1 5 10 15

Cys His Pro Ala Arg Ala Arg Lys Leu Leu Arg His Gly Arg Ala Ala

20 25 30

Val Phe Arg Arg Gln Pro Phe Thr Ile Ile Leu Ser Asp Arg Glu Ala

35 40 45

Gly Glu Ile Gln Pro Val Val Phe Lys Ala Asp Pro Gly Ser Lys Thr

50 55 60

Thr Gly Leu Ala Leu Val Ala Glu Phe Gln Arg Gly Arg Gln Val Val

65 70 75 80

Trp Ala Ala Asn Leu Thr His Arg Gly His Arg Ile Lys Ala Ala Leu

85 90 95

Thr Asp Arg Arg Met Phe Arg Arg Gly Arg Arg Gly Arg His Cys Arg

100 105 110

Tyr Arg Pro Ala Arg Phe Asp Asn Arg Thr Arg Lys Ala Gly Trp Leu

115 120 125

Pro Pro Ser Leu Met Ser Arg Val Asn Asn Val Ser Ala Trp Tyr Ser
130 135 140
Arg Leu Leu Asp Arg Thr Pro Ile Thr Ala Ala Gln Val Glu Thr Val
145 150 155 160
Arg Phe Asp Thr Gln Ala Met Gln Thr Pro Gly Ile Ser Gly Val Gln
165 170 175
Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu Leu
180 185 190

Glu Lys Trp Cys Arg Arg Cys Ala Tyr Cys Gly Ala Glu Asn Val Pro
195 200 205
Leu Glu Ile Asp His Ile His Pro Lys Ser Arg Gly Gly Ser Glu Arg
210 215 220
Ile Ser Asn Leu Thr Leu Ala Cys Val Pro Cys Asn Gln Ala Lys Ser
225 230 235 240
Asn Arg Pro Val Glu Asp Phe Leu Ala Arg Asp Leu Lys Arg Leu Ala
245 250 255

Arg Ile Lys Ala Gln Ala Lys Ala Pro Leu Lys Asp Ala Ala Ala Val
260 265 270
Asn Ala Thr Arg Tyr Ala Ile Gly Asp Thr Leu Lys Thr Phe Gly Leu
275 280 285
Pro Val Ser Phe Trp Ser Gly Gly Arg Thr Lys Phe Asn Arg Thr Ala
290 295 300
Gln Gly Tyr Ala Lys Ala His Trp Ile Asp Ala Ala Cys Val Gly Glu
305 310 315 320

Glu Gly Ser Asp Val Lys Val Pro Tyr Gly Phe Gln Pro Leu Ile Ile
325 330 335
Gln Ala Thr Gly Arg Gly Arg Arg Arg Val Arg Gly Asn Asp Arg Tyr
340 345 350
Gly Phe Pro Arg Gly Lys Pro Arg Thr Gln Lys Arg Val Tyr Gly Phe
355 360 365

Gln Thr Gly Asp Leu Ala Glu Leu Lys Cys Leu Ala Gly Lys Ser Ala
370 375 380

Gly Ala His Val Gly Arg Ile Lys Ser Ile Arg Ser Arg Gly Trp Phe
385 390 395 400
Val Leu Asp Lys His Asp Arg Pro Ala Arg Glu Phe Arg Leu Leu Gln
405 410 415
Arg Ala Asp Gly Tyr Ala Tyr Thr Ala Ala Thr Ala
420 425

<210> 540
<211> 430
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors

<220><223> Description: MG35-473 effector
<400> 540
Met Val Tyr Val Leu Asn Gln Asp Gly Gln Pro Ile Met Pro Thr Arg
1 5 10 15
Asn His Ala Lys Val Arg Val Leu Leu Lys Asn Gly Lys Ala Lys Val
20 25 30
Ile Asn Arg Cys Pro Phe Thr Ile Gln Leu Leu Tyr Pro Cys Asp Asn
35 40 45
Gln Thr Gln Ser Ile Ser Leu Gly Val Asp Ala Gly Ser Lys His Ile

50 55 60
Gly Ile Ser Ala Thr Thr Lys Gly Asp Ser Thr Gly Ala Arg Val Leu
65 70 75 80
Tyr Glu Ala Asp Val Thr Leu Arg Asn Asp Ile Val Glu Leu Leu Ser
85 90 95
Thr Arg Arg Glu Asn Arg Arg Ala Arg Arg Asn Arg Lys Ile Arg Tyr
100 105 110

Arg Lys Pro Arg Phe Asp Asn Arg Arg Arg Lys Asp Gly Trp Leu Ala

115 120 125

Pro Ser Val Gln Asn Lys Val Asn Thr His Leu Thr Val Val Ala Asn

130 135 140

Ala Cys Lys Ile Leu Pro Val Thr Lys Ile Val Val Glu Thr Ala Ser

145 150 155 160

Phe Asn Leu Gln Lys Leu Lys Ala Asp Leu Glu Gly Leu Lys Arg Pro

165 170 175

Glu Gly Ile Glu Tyr Gln Gln Gly Glu Gln Leu Gly Phe Trp Asn Ile

180 185 190

Arg Glu Tyr Val Leu Phe Arg Asp Gly His Thr Cys Gln Cys Cys Lys

195 200 205

Gly Lys Ser Lys Asp Lys Ile Leu Asn Val His His Ile Gln Ser Arg

210 215 220

Lys Thr Gly Gly Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu Thr

225 230 235 240

Cys His Thr Gly Tyr His Lys Gly Leu Val Lys Leu Pro Glu Ser Ile

245 250 255

Lys Arg Asn Lys Pro Leu Lys Asp Ala Thr Phe Met Gly Ile Met Arg

260 265 270

Trp Ala Phe Tyr Asn Lys Val Lys Glu Ile Tyr Val Pro Gln Gly Ile

275 280 285

Asp Val His Met Thr Tyr Gly Tyr Ile Thr Lys Asn Thr Arg Ile Lys

290 295 300

Asn Gly Leu Pro Lys Glu His Tyr Ile Asp Ala Arg Cys Ile Ser Asn

305 310 315 320

Tyr Pro Glu Ala Ile His Pro Trp Asn Lys Thr Glu Val Tyr Tyr Gln

325 330 335

Lys Lys Val Arg Cys His Asn Arg Gln Ile His Lys Met Ser Ile His

340 345 350

Lys Gly Gly Val Arg Lys Leu Asn Gln Ala Glu Tyr Leu Val Lys Gly

355 360 365

Tyr Arg Leu Phe Asp Arg Val Gln Tyr Gln Gly Lys Glu Tyr Phe Val

370 375 380

Phe Gly Arg Arg Lys Ser Gly Phe Phe Asp Ile Arg Thr Leu Asp Gly

385 390 395 400

Glu Lys Val Asn Lys Gly Ser Ile Ser Tyr Lys Lys Leu Lys Leu Leu

405 410 415

Glu Ile Ser Lys Gly Phe Leu Thr Glu Arg Lys Val Val Ala

420 425 430

<210> 541

<211> 446

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-474 effector

<400> 541

Met Arg Val Phe Val Lys Asn Gln Arg Gly Glu Pro Leu Met Pro Cys

1 5 10 15

Ser Pro Arg Lys Ser Arg Met Leu Leu Lys Glu Lys Lys Ala Arg Ile

20 25 30

Ile Gln Tyr Arg Pro Phe Thr Ile Gln Leu Thr Ile Ala Thr Gly Glu

35 40 45

Thr Val Gln Glu Asn Asn Leu Gly Val Asp Val Gly Ser Lys His Val

50 55 60

Gly Val Ala Val Thr Ser Gly Glu Lys Val Leu Thr Lys Gly Glu Ile

65 70 75 80

Glu Leu Arg Gln Asp Ile Lys Ser Leu Leu Glu Thr Arg Lys Thr Tyr

85 90 95

Arg Lys Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg Arg Cys Lys Phe

100 105 110

Lys Tyr Lys Thr Lys Arg Ile Tyr Asp Leu Lys Lys Lys Trp Met
115 120 125
Lys Lys Lys Leu Thr Phe Glu Ser Pro Arg Leu Lys Gly Trp Leu Pro
130 135 140
Pro Ser Ile Gln Ser Arg Ile Thr Asn Thr Phe Phe Trp Ile Asp Arg
145 150 155 160
Tyr Gln Ser Leu Leu Pro Asn Cys Arg Leu His Ile Glu Val Gly Lys
165 170 175

Phe Asp Val Gln Lys Met Met Asn Pro Asp Ile Lys Gly Lys Asp Tyr
180 185 190
Gln Glu Gly Glu Ala Phe Gly Tyr Tyr Asp Ala Arg Tyr Phe Val Leu
195 200 205
Ala Arg Asp Gln Tyr Thr Cys Gln Val Cys Lys Lys Lys Asn Lys Ile
210 215 220
Phe Asn Thr His His Val Ile Tyr Arg Ser His Gly Gly Ser Asn Arg
225 230 235 240

Ala Asp Asn Leu Ile Thr Val Cys Thr Asp Cys His Thr Pro Glu Asn
245 250 255
His Gln Lys Gly Glu Ile Phe Trp Glu Trp Met Ile Lys Lys Lys Lys
260 265 270
Thr Lys Thr Tyr Lys Glu Pro Pro Phe Met Asn Ser Leu Arg Ile Arg
275 280 285
Ile Ser Lys Arg Tyr Pro Asp Ala His Ile Thr Tyr Gly Ser Val Thr
290 295 300

Thr Pro His Arg Lys Val Leu Gly Leu Asp Lys Thr His Tyr Asn Asp
305 310 315 320
Ala Ile Ala Met Thr Gly Ile Glu Thr Ile Lys Leu Asn Pro Asn Glu
325 330 335
Arg Phe Leu Ile Lys Gln Phe Arg Lys Lys Lys Arg Ser Leu His Glu
340 345 350

Ala Thr Ala Arg Lys Gly Arg Lys Ala Lys Asn Ile Thr Gln Lys Arg
355 360 365

Asn Glu Lys Asn Thr Lys Glu Ser Asn Gly Phe His Leu Asn Asp Glu
370 375 380
Val Arg Thr Ala Cys Gly Lys Arg Gly Phe Ile Ser Gly Phe Thr Gly
385 390 395 400
Lys Thr Ala Cys Tyr Val Lys Ser Ile Asp Gly Glu Tyr Ile Val Ile
405 410 415
Lys Gly Lys Thr His Lys Gln Gln Pro Ile Lys Ser Leu Thr Phe Ile
420 425 430

Arg His Asn Gly Asn Trp Gln Tyr Gln Ile Lys Glu Asn Thr
435 440 445
<210> 542
<211> 400
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-475 effector
<400> 542
Met Leu Val Tyr Val Leu Asn Lys Asp Gly Lys Pro Leu Met Pro Cys
1 5 10 15
Lys Pro Gln Lys Ala Arg Lys Leu Leu Glu Ser Lys Lys Ala Lys Val

20 25 30
Val Lys Arg Glu Pro Phe Thr Ile Gln Leu Leu Tyr Gly Ser Ser Gly
35 40 45
Tyr Lys Gln Glu Ile Thr Leu Gly Val Asp Ser Gly Ser Lys Asn Ile
50 55 60
Gly Leu Ser Ala Thr Thr Glu Asn Ser Glu Leu Tyr Ser Ala Glu Ile
65 70 75 80

Gln Leu Arg Ser Asp Ile Val Asp Leu Leu Ser Thr Arg Arg Gln Asn

85 90 95

Arg Arg Thr Arg Arg Asn Arg Leu Arg Tyr Arg Lys Pro Arg Phe Leu

100 105 110

Asn Arg Val Arg Ser Lys Asn Lys Gly Trp Leu Ala Pro Ser Ile Glu

115 120 125

His Lys Ile Ala Thr His Leu Arg Val Ile Glu Asn Ala His Lys Ile

130 135 140

Leu Pro Ile Ser Lys Ile Ile Val Glu Val Ala Ser Phe Asp Ile Gln

145 150 155 160

Lys Ile Lys Asn Pro Asp Ile Gln Gly Ile Glu Tyr Gln Gln Gly Glu

165 170 175

Gln Leu Asn Phe Trp Asn Val Arg Glu Tyr Val Leu Phe Arg Asp Asn

180 185 190

His Thr Cys Gln Cys Cys Lys Gly Lys Lys Lys Asp Lys Ile Leu Asn

195 200 205

Val His His Ile Glu Ser Arg Lys Thr Gly Gly Asp Ala Pro Asn Asn

210 215 220

Leu Ile Thr Leu Cys Glu Thr Cys His Asn Gly Tyr His Lys Gly Thr

225 230 235 240

Val Lys Leu Pro Lys Thr Ile Lys Arg Gly Met Ser Phe Lys Asp Thr

245 250 255

Thr Phe Met Gly Ile Met Arg Trp Ser Phe Tyr Asn Arg Leu Lys Ser

260 265 270

Gln Tyr Ser Asn Val Ser Leu Thr Tyr Gly Tyr Ile Thr Lys Asn Thr

275 280 285

Arg Ile Gln Ser Gly Leu Glu Lys Ser His Arg Ile Asp Ala Arg Cys

290 295 300

Ile Ser Gly Asn Pro Leu Ala Lys Pro Leu Glu Cys Trp Tyr Phe Ser

305 310 315 320

Lys Gln Val Arg Asn His Asn Arg Gln Ile His Lys Ala Asn Ile Leu

325 330 335

Lys Gly Gly Lys Lys Lys Leu Asn Gln Ala Pro Tyr Glu Val Lys Gly

340 345 350

Phe Arg Leu Phe Asp Lys Val Glu Tyr Val Gly Lys Glu Gly Phe Ile

355 360 365

Phe Gly Arg Arg Ser Thr Gly Tyr Phe Asp Ile Arg Thr Leu Asp Gly

370 375 380

Ile Ser Ile His Lys Ser Ala Ser Tyr Lys Lys Leu Lys Leu Ile Asp

385 390 395 400

<210> 543

<211> 427

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-476 effector

<400> 543

Met Leu Val Tyr Val Leu Asn Lys Asn Glu Lys Pro Leu Met Pro Cys

1 5 10 15

Asn Pro Thr Lys Ala Arg Lys Leu Leu Lys Gln Asn Lys Ala Lys Val

20 25 30

Leu Arg Ile Glu Pro Phe Thr Ile Gln Leu Leu Tyr Gly Ser Ser Gly

35 40 45

Tyr Lys Gln Asn Ile Thr Leu Gly Val Asp Ala Gly Ser Lys His Ile

50 55 60

Gly Leu Ser Ala Ser Thr Pro Ile Lys Glu Leu Tyr Ala Ala Asp Val

65 70 75 80

Glu Leu Arg Asn Asp Ile Val Asp Leu Leu Ser Thr Arg Arg Gln Asn

85 90 95

Arg Arg Thr Arg Arg Asn Arg Lys Thr Arg Tyr Arg Lys Cys Lys Phe

100 105 110

Leu Asn Arg Val Lys Ser Lys Asn Lys Gly Trp Leu Ala Pro Ser Ile
115 120 125
Glu Asn Lys Ile Asp Ala His Phe Lys Ser Ile Ala Gln Val Asn Lys
130 135 140
Ile Leu Pro Ile Thr Asn Ile Val Val Glu Thr Ala Ser Phe Asp Ile
145 150 155 160
Gln Lys Ile Lys Asn Pro Glu Ile Ser Ser Lys Gln Tyr Gln Glu Gly
165 170 175

Asp Gln Leu Gly Phe Trp Asn Val Arg Glu Phe Val Leu Trp Arg Asp
180 185 190
Asn His Thr Cys Gln Cys Cys Lys Gly Lys Ser Lys Asp Lys Ile Leu
195 200 205
Asn Val His His Ile Glu Ser Arg Lys Thr Gly Gly Asp Ala Pro Asn
210 215 220
Asn Leu Ile Thr Leu Cys Glu Thr Cys His Thr Gly Tyr His Lys Gly
225 230 235 240

Thr Leu Lys Leu Pro Ser Ser Ile Lys Arg Gly Ala Ser Phe Lys Asp
245 250 255
Ala Thr Phe Met Gly Val Met Arg Trp Ser Phe Tyr Asn Arg Leu Lys
260 265 270
Lys Leu Tyr Ser Asn Ile Ser Met Thr Tyr Gly Tyr Ile Thr Lys Asn
275 280 285
Thr Arg Ile Glu Asn Gly Leu Pro Lys Glu His Tyr Ile Asp Ala Leu
290 295 300

Cys Ile Ser Gly His Pro Lys Ala Lys Gln Leu Asp Tyr Tyr Tyr Tyr
305 310 315 320
Gln Lys Gln Val Arg Arg Asn Asn Arg Gln Ile Tyr Lys Ala Asn Ile
325 330 335
Leu Lys Gly Gly Lys Lys Lys Leu Asn Gln Ala Pro Arg Tyr Val Lys
340 345 350

Gly Phe Gln Leu Phe Asp Lys Val Lys Tyr Asp Gly Asp Ser Tyr Tyr
355 360 365

Ile Phe Gly Arg Arg Ser Asn Gly Tyr Phe Asp Ile Arg Lys Leu Asp
370 375 380
Gly Thr Lys Val Asn Asn Gly Ser Ile Asn Tyr Lys Tyr Leu Lys Arg
385 390 395 400
Leu Glu Ser Arg Arg Asn Met Leu Thr Glu Arg Arg Ser Arg Ser Pro
405 410 415
Leu Met Thr Glu Val Thr Ser Leu Arg Thr Val
420 425

<210> 544
<211> 424

<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-477 effector
<400> 544
Met Leu Val Tyr Val Leu Asn Lys His Gly Lys Pro Leu Met Pro Cys
1 5 10 15
Lys Pro Ser Lys Ala Arg Lys Leu Leu Lys Glu Glu Lys Ala Lys Val
20 25 30
Ile Arg Lys Glu Pro Phe Thr Ile Gln Leu Leu Tyr Gly Ser Ser Gly

35 40 45
Tyr Lys Gln Pro Ile Thr Leu Gly Val Asp Ala Gly Ser Lys Thr Val
50 55 60
Gly Leu Ser Ala Thr Thr Glu Asn Lys Glu Leu Phe Ala Ala Glu Val
65 70 75 80
Glu Leu Arg Asp Asp Ile Pro Lys Leu Ile Ser Gln Lys Arg Gln Tyr
85 90 95

Arg Arg Asp Arg Arg Phe Arg Lys Thr Arg Tyr Arg Lys Pro Arg Phe

100 105 110

Leu Asn Arg Val His Ser Lys Asn Lys Gly Trp Leu Ala Pro Ser Val

115 120 125

Glu His Lys Ile Lys Ser His Ile Lys Leu Ile Asp Leu Val His Ser

130 135 140

Leu Leu Pro Val Thr Lys Ile Val Val Glu Val Ala Ser Phe Asp Ile

145 150 155 160

Gln Lys Ile Lys Asn Pro Asn Ile Glu Gly Lys Gln Tyr Gln Gln Gly

165 170 175

Glu Gln Leu Asp Phe Trp Asn Val Arg Glu Tyr Val Leu Trp Arg Asp

180 185 190

Asn Tyr Thr Cys Gln His Cys Lys Gly Lys Thr Lys Asp Lys Arg Leu

195 200 205

Asn Ile His His Ile Glu Ser Arg Gln Ile Gly Gly Asp Ala Pro Asn

210 215 220

Asn Leu Ile Thr Leu Cys Glu Thr Cys His Lys Asp Tyr His Asp Gly

225 230 235 240

Lys Ile Lys Leu Asn Phe Lys Arg Gly Gln Lys Phe Lys Asp Ala Thr

245 250 255

Phe Met Gly Ile Met Arg Trp Thr Leu Tyr Asn Arg Leu Lys Thr Leu

260 265 270

Tyr Pro Asn Ile His Leu Thr Tyr Gly Tyr Ile Thr Lys Asn Thr Arg

275 280 285

Ile Gln Asn Gly Leu Pro Lys Thr His Arg Ile Asp Ala Leu Cys Ile

290 295 300

Ser Gly His Pro Gln Ala Lys Gln Leu Glu His Tyr Tyr His Ile Lys

305 310 315 320

Glu Val Arg Arg His Asn Arg Gln Ile His Lys Ala Asn Ile Leu Lys

325 330 335

Gly Gly Ile Arg Lys Leu Asn Gln Ala Pro Tyr Leu Val His Gly Phe

340 345 350

Arg Leu Phe Asp Lys Val Lys Tyr Asn Gly Ile Lys Cys Phe Ile Tyr

355 360 365

Gly Arg Arg Ser Thr Gly Tyr Phe Asp Ile Arg Lys Val Asp Gly Thr

370 375 380

Val Ile His Arg Ser Ala Lys Ser Lys Asp Leu Ile Leu Val Ser Lys

385 390 395 400

Thr Lys Thr Leu Leu Trp Glu Arg Arg Glu Asn Ser Ala Phe Leu Ser

405 410 415

Pro Leu Asn Arg Ala Ser Ala Ser

420

<210> 545

<211> 439

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-478 effector

<400> 545

Met Gln Arg Val Leu Val Leu Ser Lys Asn Arg Glu Pro Leu Met Pro

1 5 10 15

Cys His Pro Ala Arg Ala Arg Glu Leu Leu Asp Lys Gly Arg Ala Arg

20 25 30

Val Phe Arg Gln Tyr Pro Phe Thr Ile Ile Leu Val Asp Arg Glu Asp

35 40 45

Gly Asp Val Gln Pro Ile Thr Leu Lys Val Asp Pro Gly Ser Arg Ile

50 55 60

Thr Gly Met Ala Leu Val Ala Asp Phe Lys Arg Gly Lys Arg Leu Ile

65 70 75 80

Trp Ala Ala Glu Leu Thr His Arg Gly Gln Gln Ile Lys Asp Ala Leu

85 90 95

Leu Ser Arg Arg Gln His Arg Arg Gly Arg Arg His Arg Lys Thr Arg

100 105 110

Tyr Arg Pro Ala Arg Phe Asn Asn Arg Arg Gly Arg Asp Gly Lys Leu

115 120 125

Pro Pro Ser Leu Gln Ser Arg Val Asp Asn Ile Phe Thr Trp Ala Asn

130 135 140

Arg Leu Tyr Arg Trp Ser Pro Val Ser Ala Ile Ser Met Glu Leu Val

145 150 155 160

Arg Phe Asp Thr Gln Leu Met Glu Asn Pro Glu Ile Asn Gly Ile Glu

165 170 175

Tyr Gln Gln Gly Glu Leu Gln Gly Tyr Glu Val Arg Glu Tyr Leu Leu

180 185 190

Glu Lys Trp Gly Arg Lys Cys Ala Tyr Cys Gly Ala Glu His Leu Pro

195 200 205

Leu Gln Ile Glu His Ile Ile Pro Arg Ser Arg Gly Gly Ser Asn Arg

210 215 220

Val Ser Asn Leu Thr Leu Ala Cys Ala Ser Cys Asn Leu Asp Lys Gly

225 230 235 240

Asn Arg Thr Ala Glu Glu Tyr Gly Phe Pro Glu Ile His Gln Tyr Ala

245 250 255

Lys Arg Pro Leu Lys Asp Ala Ala Ala Val Asn Ala Thr Arg Trp Ala

260 265 270

Ile Tyr Arg Gly Phe Glu Gln Asp Gly Leu Pro Leu Glu Val Gly Thr

275 280 285

Gly Gly Arg Thr Lys Phe Asn Arg Met Gln Gln Asp Tyr Pro Lys Ala

290 295 300

His Trp Ile Asp Ala Ala Cys Val Gly Ala Ser Gly Arg Asp Val Phe

305 310 315 320

Ile His Pro Gln Thr Gln Pro Leu Arg Ile Arg Ala Thr Gly Arg Gly

325 330 335

Ser Arg Gln Met Cys Arg Val Asp Lys Tyr Gly Phe Pro Arg Thr Ser

340 345 350

Ala Lys Arg Gly Arg Ile Gln Tyr Gly Phe Gln Thr Gly Asp Met Val

355 360 365

Arg Ala Val Val Thr Asn Gly Lys Lys Met Gly Thr Tyr Ile Gly Arg

370 375 380

Val Ala Val Arg Ser Ser Gly Ser Phe Asn Ile Thr Thr Asp Ala Gly

385 390 395 400

Val Val Gln Gly Ile Gly Tyr Arg Tyr Cys Thr Pro Leu His Lys Leu

405 410 415

Asp Gly Tyr Ala Tyr Glu Lys Gly Glu Lys Ala Leu Leu Pro Ile Ala

420 425 430

Glu Ala Arg Gly Phe Arg Ala

435

<210> 546

<211> 502

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-479 effector

<400> 546

Met Ser Ile Ile Tyr Val Gln Asp Arg His Gly Lys Pro Leu Ala Pro

1 5 10 15

Thr Thr Arg Gly Gly His Val Arg Arg Leu Leu Asp Ser Lys Gln Ala

20 25 30

Arg Val Val Cys Gly Asn Pro Phe Thr Ile Arg Leu Met Tyr Gly Val

35 40 45

Asp Pro Cys Thr Gln Gly Phe Ile Leu Gly Ile Asp Pro Gly Arg Thr

50 55 60

Asn Ile Gly Val Thr Val Ala Ala Ala Asp Gly Thr Cys Val Phe Ser

65 70 75 80

Ala Lys Ala Glu Thr Asn Asn Lys Asp Val Pro Lys Arg Met Lys Glu

85 90 95

Arg Lys Ala His Arg Gln Ala Ser Arg Gln Gly Glu Arg Lys Arg Arg

100 105 110

Gln Arg Arg Ala Arg Lys Asn Gly Thr Cys Phe Gly Glu Arg Lys Arg

115 120 125

Ile Leu Pro Gly Cys Lys Glu Pro Ile Thr Asn His Tyr Ile Thr Asn

130 135 140

Thr Glu Ala Arg Phe Met Asn Arg Ala Arg Thr Lys Gly Trp Leu Thr

145 150 155 160

Pro Thr Ala Asn Gln Leu Leu Gln Ser Thr Ile Ser Leu Val Arg Lys

165 170 175

Val Cys Lys Phe Leu Pro Val Thr Asp Val Val Leu Glu Leu Asn Glu

180 185 190

Phe Ala Phe Met Ala Met Asp Asp Pro Gly Ile Gln Arg Trp Glu Tyr

195 200 205

Gln Lys Gly Pro Leu Tyr Gly Tyr Gly Ser Val Glu Ala Ala Val Tyr

210 215 220

Thr Gln Gln Asp Gly His Cys Ile Phe Cys Glu Gln Ala Ile Ala His

225 230 235 240

Cys His His Val Ile Pro Ala Ser Lys Gly Gly Ser Asp Thr Leu Glu

245 250 255

Asn Arg Ala Gly Leu Cys Gly Gly His His Asp Leu Val His Lys Glu

260 265 270

Gln Ser Trp Thr Asp Lys Leu Ala Glu Leu Lys Ala Gly Met Asn Lys

275 280 285

Arg Tyr Ala Ala Leu Ser Val Val Asn Gln Ile Ile Pro Arg Leu Ala

290 295 300

Asp Glu Leu Gly Lys Met Phe Pro Gly His Ala Phe Ala Thr Asn Gly

305 310 315 320

Trp Ser Thr Lys Gln Phe Arg Asp Ala His Gly Ile Pro Lys Asp His

325 330 335

Asn Thr Asp Ala Asp Cys Ile Ala Cys Ser Ile Leu Glu Asn Pro Thr

340 345 350

Ile Lys Leu Pro Glu Lys Val Tyr Glu Leu Arg Lys Phe Arg Arg His

355 360 365

Asp Arg Ala Gln Ile Ser Arg Met Glu Asp Arg Asn Tyr Tyr Leu Pro

370 375 380

Gly Ala Asp Pro Lys Thr Gly Lys Pro Lys Lys Val Leu Ala Ala Lys

385 390 395 400

Asn Arg His Lys Arg Thr Glu Gln Lys Thr Asp Ser Leu Glu Glu Phe

405 410 415

Arg Ala Ala His Pro Asn Asp Val Gly Arg Leu Met Val Ala Arg Gly

420 425 430

Gly Pro Lys His Lys Asp Pro Asn Arg Val Leu Pro Gly Ala Ile Phe

435 440 445

Gln Val Glu Thr Ser Ser Gly Asn Val Glu Gln Leu Val Leu Gln Gly

450 455 460

Ser His Gly Arg Asp Lys Asn Gly Gln Pro Leu Tyr Met Glu Phe Val

465 470 475 480

Gly Gln Gly Asn Phe Arg Pro Asn Arg Cys Lys Tyr Val Ala Arg Gly

485 490 495

Arg Gly Trp Gln Phe Val

500

<210> 547

<211> 409

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-480 effector

<400> 547

Met Arg Lys Cys His Val Arg Phe Val Gly Glu Gly Gly Thr Ala Thr

1 5 10 15

Tyr Ala Leu Leu Pro Asp Leu Lys Arg Ala Val Asn Thr Thr Glu Gln

20 25 30

Ser Met Ala Phe Arg Pro Ala Ser Tyr Glu Ile Lys Leu Asp Pro Gly

35 40 45

Ser Lys Thr Thr Gly Ile Ala Leu Leu Lys Gly Glu Asn Ile Ile Phe

50 55 60

Val Gly Glu Leu Asn His Arg Gly Gln Ala Ile Lys Ala Ser Leu Asp

65 70 75 80

Ser Arg Arg Ala Ile Arg Arg Ser Arg Arg Ala Arg His Thr Arg Tyr

85 90 95

Arg Gln Ala Arg Phe Leu Asn Arg Ile Arg Pro Lys Gly Trp Leu Ala

100 105 110

Pro Ser Leu Lys His Arg Val Asp Thr Thr Leu Thr Trp Val Asn Lys

115 120 125

Phe Ile Lys Phe Ala Pro Val Asn Ser Ile Ala Met Glu Leu Val Arg

130 135 140

Phe Asp Leu Gln Gln Leu Glu Lys Pro Glu Ile Ser Gly Val Glu Tyr

145 150 155 160

Gln Gln Gly Glu Leu Leu Gly Tyr Glu Ile Arg Glu Tyr Leu Leu Asn

165 170 175

Lys Trp Glu Arg Lys Cys Thr Tyr Cys Lys Val Glu Asn Ile Pro Leu

180 185 190

Gln Val Glu His Ile His Pro Lys Ala Lys Gly Gly Ser Asn Arg Ile

195 200 205

Ser Asn Leu Cys Leu Ala Cys Glu Lys Cys Asn Leu Lys Lys Gly Thr

210 215 220

Gln Asp Ile Asn Asp Phe Leu Leu Lys Lys Pro Asp Leu Leu Lys Gln

225 230 235 240

Ile Met Ala Gln Val Lys Gln Pro Leu Lys Asp Ala Thr Ala Val Asn

245 250 255

Ser Thr Arg Trp Ala Leu Phe Asn Gln Leu Lys Leu Thr Gly Leu Pro

260 265 270

Val Thr Thr Gly Ser Gly Gly Gln Thr Lys Tyr Asn Arg Thr Arg Leu

275 280 285

Glu Leu Pro Lys Thr His Tyr Phe Asp Ala Ala Cys Val Gly Lys Val

290 295 300

Asp Lys Leu Ile Val Leu Thr Thr Gln Pro Leu Leu Ile Lys Ala Asn

305 310 315 320

Gly His Gly Thr Arg Gln Met Cys Arg Thr Asp Lys Phe Gly Phe Pro

325 330 335

Ser Arg Tyr Val Pro Arg Asp Lys Phe Val Lys Gly Phe Gln Thr Gly

340 345 350

Asp Leu Val Lys Ala Val Val Thr Arg Gly Lys Lys Val Gly Gln Tyr

355 360 365

Ile Gly Arg Val Ala Val Arg Ser Ser Gly Ser Phe Asn Ile Ser Ala

370 375 380

Lys Glu Leu Val Gln Gly Ile Ser His Lys Tyr Cys Gln Thr Leu Gln

385 390 395 400

Arg Lys Asp Gly Tyr Ser Tyr Gln Phe

405

<210> 548

<211> 416

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-481 effector

<400> 548

Met Ser Asn Tyr Val Phe Leu Ile Asp Ala Asn Lys Gln Pro Met Asn

1 5 10 15

Pro Ile His Pro Ala His Ala Arg Lys Leu Met Glu Leu Gly Lys Ala

20 25 30

Ala Val Phe Arg Met Tyr Pro Phe Thr Leu Ile Met Asn Arg Ile Val

35 40 45

Asp Lys Ile Ile Thr Tyr Pro Leu Ser Leu Arg Ile Asp Pro Gly Ser

50 55 60

Lys Leu Thr Gly Ile Ser Ile Val Asn Asn Arg Asp Glu Val Ile Trp

65 70 75 80

Ala Met Glu Leu Gln His Arg Gly Trp Val Ile Lys Asp Ala Leu Glu

85 90 95

Thr Arg Lys Ala Ala Arg Arg Gly Arg Arg Asn Arg His Thr Arg Tyr

100 105 110

Arg Gln Ala Arg Phe Leu Asn Arg Lys Arg Ser Lys Gly Trp Leu Ala

115 120 125

Pro Ser Leu Met His Arg Val Leu Thr Ile Glu Thr Trp Val Lys Arg

130 135 140

Leu Ile Lys Phe Ser Pro Val Ala Glu Ile Arg Gln Glu Leu Val Arg

145 150 155 160

Phe Asp Thr Gln Ala Ile Gln Asn Pro Glu Ile Ser Gly Thr Glu Tyr

165 170 175

Gln Gln Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu

180 185 190

Lys Trp Gly Arg Lys Cys Thr Tyr Cys Ser Lys Glu Cys Val Pro Leu

195 200 205

Gln Ile Glu His Ile Gln Ala Arg Ala Asn Gly Gly Thr Asp Arg Val

210 215 220

Ser Asn Leu Cys Leu Ala Cys Glu Lys Cys Asn Gln Lys Lys Gly Thr

225 230 235 240

Lys Asp Leu Lys Asp Phe Leu Lys Gly Lys Pro Asp Leu Val Ser Arg

245 250 255

Ile Leu Lys Gln Ala Lys Ala Pro Leu Lys Asp Ala Ala Ala Val Asn

260 265 270

Ser Thr Arg Trp Lys Leu Phe Glu Thr Leu Lys Val Leu Gly Leu Pro

275 280 285

Val Thr Thr Gly Thr Gly Gly Gln Thr Lys Tyr Asn Arg Thr Arg Leu

290 295 300

Arg Leu Pro Lys Glu His Trp Leu Asp Ala Ala Cys Val Gly Val Thr

305 310 315 320

Glu Ser Leu Lys Val Leu Thr Ser Lys Ile Leu Lys Val Lys Ala Thr

325 330 335

Gly Tyr Gly Thr Arg Arg Leu Cys Arg Met Asp Lys Phe Gly Phe Pro

340 345 350

Cys Ser Lys Pro Arg Gln Ser Tyr Lys Thr Ser Trp Lys Thr Gly Asp

355 360 365

Ile Ala Arg Thr Ile Asp Arg Ile Ile Gly Arg Val Val Val Gln Asn

370 375 380

Glu Lys Arg Leu Glu Val Arg Val Asn Gly Lys Arg His Tyr Cys Lys

385 390 395 400

Pro Asp Glu Val Lys Pro Ile His Arg Lys Asp Gly Tyr Ser Tyr Ala

405 410 415

<210> 549

<211> 426

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-482 effector

<400> 549

Met Leu Lys Pro Asn Leu Val Phe Val Leu Asp Thr His Arg Lys Pro

1 5 10 15

Leu Ile Pro Cys Lys Pro Ser Val Ala Arg Arg Leu Leu Asn Ala Gly

20 25 30

Lys Ala Ala Ala Phe Arg Arg Phe Pro Phe Thr Ile Ile Leu Lys Lys
35 40 45
Glu Val Thr Asp Thr Pro Glu Ser Ile Glu Leu Lys Leu Asp Pro Gly
50 55 60
Ser Lys Thr Thr Gly Ile Ala Leu Lys Gln Gly Asn Lys Ile Ile Phe
65 70 75 80
Gly Ala Glu Leu Thr His Arg Gly Gln Ala Ile Lys Ala Ser Leu Glu
85 90 95

Leu Arg Arg Ser Leu Arg Arg Gly Arg Arg Asn Arg His Thr Arg Tyr
100 105 110
Arg Gln Ala Arg Phe Leu Asn Arg Thr Arg Leu Lys Gly Trp Leu Ala
115 120 125
Pro Ser Leu Gln His Arg Val Glu Thr Thr Met Thr Trp Val Asn Arg
130 135 140
Phe Ile Arg Leu Ala Pro Ile Gly Ser Ile Val Gln Glu Leu Val Arg
145 150 155 160

Phe Asp Leu Pro Gln Leu Glu Asn Pro Glu Ile Ser Gly Ile Glu Tyr
165 170 175
Gln Gln Gly Glu Leu Gln Gly Tyr Glu Val Arg Glu Tyr Leu Leu Asn
180 185 190
Lys Trp Asp Arg Lys Cys Ala Tyr Cys Gly Ala Glu Asn Val Pro Leu
195 200 205
Gln Val Glu His Ile His Pro Arg Ala Lys Gly Gly Ser Asn Arg Ile
210 215 220

Ser Asn Leu Cys Leu Ala Cys Glu Lys Cys Asn Leu Lys Lys Gly Thr
225 230 235 240
Gln Ser Ile Glu Gln Phe Leu Val Asn Lys Pro Asp Leu Leu Lys Gln
245 250 255
Ile Leu Gly Gln Ala Lys Arg Pro Leu Lys Asp Ala Ala Ala Val Asn
260 265 270

Ser Thr Arg Trp Ser Leu Phe Asn Arg Leu Lys Gln Ser Gly Leu Pro
275 280 285

Val Val Thr Gly Ser Gly Gly Leu Thr Lys Phe Asn Arg Thr Arg Leu
290 295 300
Glu Leu Pro Lys Ala His Trp Leu Asp Ala Ala Cys Ala Gly Gln Val
305 310 315 320
Glu Phe Ile Glu Leu Val Thr Asn Gln Pro Leu Gln Ile Lys Ala Thr
325 330 335
Gly His Gly Thr Arg Gln Met Cys Arg Thr Asp Lys Phe Gly Phe Pro
340 345 350

Ser Arg Tyr Val Pro Arg Phe Lys Phe Val Gln Gly Phe Gln Thr Gly
355 360 365
Asp Ile Val Lys Ala Val Val Ala Thr Gly Lys Lys Val Gly Glu Tyr
370 375 380
Val Gly Arg Val Ala Val Arg Ser Thr Gly Ser Phe Asn Ile Ser Asp
385 390 395 400
Pro Ser Gly Leu Val Gln Gly Ile Ser His Lys Tyr Cys Lys Pro Ile
405 410 415

Gln Arg Lys Asp Gly Tyr Gly Tyr Gly Phe
420 425

<210> 550
<211> 421
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-483 effector
<400> 550
Met Gly Phe Gly Lys Glu Thr Asp Phe Val Ile Tyr Val Ile Ser Lys
1 5 10 15
Asn Gly Gln Pro Leu Met Pro Thr Glu Asn His Ala Lys Val Arg Ile

20 25 30

Leu Leu Lys Asn Glu Lys Ala Lys Val Ile Lys Arg Cys Pro Phe Thr
35 40 45
Ile Gln Leu Ala Tyr Asp Ser Thr Asn Tyr Thr Gln Asp Ile Thr Leu
50 55 60
Gly Val Asp Ser Gly Ser Lys His Ile Gly Leu Ser Ala Thr Thr Lys
65 70 75 80
Asp Lys Val Leu Phe Glu Ser Asp Val Glu Leu Arg Asn Asp Ile Val
85 90 95

Asp Leu Leu Ser Thr Arg Arg Gln Asn Arg Arg Thr Arg Arg Asn Arg
100 105 110
Lys Thr Arg Tyr Arg Lys Pro Arg Phe Asp Asn Arg Lys Arg Lys Asp
115 120 125
Gly Trp Leu Ala Pro Ser Val Gln Asn Lys Val Asp Thr His Leu Thr
130 135 140
Val Ile His Lys Val Tyr Glu Ile Leu Pro Ile Thr Lys Ile Ile Val
145 150 155 160

Glu Val Ala Ser Phe Asp Ile Gln Lys Ile Lys Asn Pro Thr Ile Ser
165 170 175
Gly Thr Glu Tyr Gln Gln Gly Glu Gln Leu Asp Phe Trp Asn Ile Arg
180 185 190
Glu Tyr Val Leu Phe Arg Asp Gly His Met Cys Arg Cys Cys Lys Gly
195 200 205
Lys Ser Lys Asp Lys Ile Leu Asn Val His His Ile Glu Ser Arg Lys
210 215 220

Ile Gly Gly Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu Thr Cys
225 230 235 240
His Lys Gly Tyr His Lys Gly Thr Val Ser Leu Pro Lys Thr Ile His
245 250 255
Arg Gly Met Ser Phe Lys Asp Ala Ala Phe Met Gly Ile Met Arg Trp
260 265 270

Ala Phe Tyr Asn Arg Leu Lys Glu Ile Tyr Ser Asn Val Ser Leu Thr
275 280 285

Tyr Gly Tyr Ile Thr Lys Asn Thr Arg Ile Gly Asn Asn Leu Pro Lys
290 295 300
Asp His Tyr Val Asp Ala Arg Cys Ile Ser Gly Asn Pro Ser Ala Val
305 310 315 320
Ser Asp Gly Met Val Tyr Tyr Gln Lys Lys Val Arg Cys His Asn Arg
325 330 335
Gln Ile His Lys Asn Thr Ile Leu Lys Gly Gly Asn Arg Lys Arg Asn
340 345 350

Gln Ala Pro Tyr Glu Val Thr Gly Phe Arg Leu Tyr Asp Lys Val Arg
355 360 365
Trp Lys Ala Gln Ile Cys Phe Ile Phe Gly Arg Arg Ser Thr Gly Arg
370 375 380
Met Asp Leu Arg Ser Leu Asn Gly Thr Lys Ile Asn Ala Ser Val Gly
385 390 395 400
Tyr Lys Asn Leu Lys Leu Leu Glu Met Arg Lys Asn Thr Leu Ile Glu
405 410 415

Ile Arg Lys Val Gly
420

<210> 551
<211> 412
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-484 effector
<400> 551
Met Val Tyr Val Leu Asn Gln Asn Gly Gln Pro Leu Met Pro Thr Glu
1 5 10 15
Asn His Ala Lys Val Arg Ile Leu Leu Lys Gln Gly Lys Ala Lys Val

20 25 30

Val Asn Lys Cys Pro Phe Thr Ile Gln Leu Leu Tyr Ser Ser Thr Asn
35 40 45
Tyr Thr Gln Lys Val Thr Leu Gly Val Asp Ser Gly Ser Lys His Ile
50 55 60
Gly Leu Ser Ala Thr Thr Lys Asn Lys Val Leu Phe Glu Ser Asp Val
65 70 75 80
Glu Leu Arg Asn Asn Ile Val Asp Leu Leu Ser Thr Arg Arg Glu Leu
85 90 95

Arg Arg Ser Arg Arg Ser Arg Lys Leu Arg Tyr Arg Lys Pro Arg Phe
100 105 110
Asn Asn Arg Lys Arg Ser Asp Gly Trp Leu Ala Pro Ser Val Lys Gln
115 120 125
Lys Val Asp Ser His Ile Thr Met Ile Ala Lys Val His Lys Ile Leu
130 135 140
Pro Ile Ser Asn Ile Ile Val Glu Ala Ala Ser Phe Asp Ile Gln Lys
145 150 155 160

Ile Lys Asn Pro Ala Ile Ser Gly Ala Asp Tyr Gln Gln Gly Glu Gln
165 170 175
Leu Asp Phe Trp Asn Val Arg Glu Tyr Val Leu Phe Arg Asp Gly His
180 185 190
Lys Cys Gln Cys Cys His Gly Lys Ser Lys Asp Lys Ile Leu Thr Val
195 200 205
His His Ile Glu Ser Arg Lys Thr Gly Gly Asn Ala Pro Asn Asn Leu
210 215 220

Ile Thr Leu Cys Glu Thr Cys His Thr Gly Tyr His Lys Gly Ile Val
225 230 235 240
Lys Leu Pro Lys Thr Ile His Arg Gly Met Ser Phe Lys Asp Ala Thr
245 250 255
Phe Met Gly Ile Met Arg Trp Ala Leu Tyr Glu Lys Leu Lys Thr Ile
260 265 270

Tyr Ser Asp Val Lys Leu Thr Tyr Gly Tyr Ile Thr Lys Asn Ile Arg
275 280 285

Ile Lys Asn Gly Leu Pro Lys Asp His Tyr Ile Asp Ala Arg Cys Ile
290 295 300
Ser Gly Asn Pro Asn Ala Val Asn Asn Gly Asp Val Tyr Tyr Tyr Lys
305 310 315 320
Lys Val Arg Cys His Asn Arg Gln Ile His Lys Asn Thr Ile Leu Lys
325 330 335
Gly Gly Tyr Arg Lys Arg Asn Gln Ala Ala Tyr Glu Val Lys Gly Phe
340 345 350

Arg Leu Tyr Asp Lys Val Leu Trp Lys Gly Gln Lys Cys Phe Ile Phe
355 360 365
Gly Arg Arg Ser Thr Gly Arg Met Asp Leu Arg Leu Leu Asp Gly Thr
370 375 380
His Leu Asn Ala Ser Val Gly Tyr Lys Asn Leu Lys Leu Leu Lys Met
385 390 395 400
Arg Ser Asn Tyr Leu Ile Glu Gln Arg Lys Val Gly
405 410

<210> 552

<211

> 434

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-485 effector

<400> 552

Met Val Tyr Val Leu Asn Lys Asp Gly Lys Pro Leu Met Pro Thr Asn
1 5 10 15
Arg Cys Ala Lys Val Arg Ile Leu Leu Lys Glu Lys Lys Ala Arg Val
20 25 30

Val Lys Ser Lys Pro Phe Thr Ile Gln Leu Leu Tyr Glu Thr Lys Asn

35 40 45

Tyr Thr Gln Pro Ile Thr Leu Gly Ile Asp Ser Gly Tyr Leu Asn Ile

50 55 60

Gly Phe Ser Ala Val Thr Asn Asn Lys Glu Leu Ile Ser Gly Glu Val

65 70 75 80

Ala Leu Leu Gln Gly Met Ser Glu Arg Leu Lys Glu Lys Arg Met Tyr

85 90 95

Arg Lys Gln Arg Arg Ser Arg Leu Arg His Arg Glu Pro Arg Phe Asn

100 105 110

Asn Arg Lys His Lys Glu Gly Trp Leu Ala Pro Ser Ile Gln His Lys

115 120 125

Leu Asp Ser His Val Arg Phe Ile Glu Gly Leu Lys Ser Ile Leu Pro

130 135 140

Ile Thr Asn Thr Ile Ile Glu Val Ala Asn Phe Asp Ile Gln Lys Ile

145 150 155 160

Lys Asp Pro Ser Ile Val Gly Lys Asp Tyr Gln Asn Gly Glu Gln Lys

165 170 175

Asp Phe Tyr Asn Thr Arg Glu Tyr Ile Phe Tyr Arg Asp His Tyr Thr

180 185 190

Cys Gln Ile Cys Lys Arg Thr Asp Ile Pro Leu Gln Val His His Ile

195 200 205

Gly Tyr Trp Lys Gly Asn Arg Ser Asn Arg Pro Glu Asn Leu Ala Thr

210 215 220

Leu Cys Val Lys Cys His Thr Pro Lys Asn His Glu Lys Gly His Ile

225 230 235 240

Leu Tyr Asn Trp Lys Pro Lys Leu Asn Gly Tyr Lys Asp Ala Thr Phe

245 250 255

Met Ser Ile Val Arg Trp Arg Leu Val Asp Ile Leu Asn Cys Gln Tyr

260 265 270

Thr Tyr Gly Tyr Ile Thr Lys Ser Gln Arg Ile Lys Leu Asn Leu Pro

275 280 285

Lys Thr His Tyr Asn Asp Ala Phe Cys Ile Ala Gly Gly Lys Thr Gln

290 295 300

Glu Arg Ile Glu Pro Ile Phe Tyr Lys Gln Val Arg Arg Asn Asn Arg

305 310 315 320

Ser Leu Glu Lys Phe Tyr Asp Ala Lys Tyr Ile Asp Ile Arg Thr Asn

325 330 335

Glu Lys Val Lys Ser Gln Glu Leu Phe Ser Gly Arg Arg Thr Arg Asn

340 345 350

Lys Asn Asn Asn Thr Glu Asn Leu His Lys Tyr Arg Arg Glu Lys Val

355 360 365

Ser Ala Gly Arg Lys Thr Ile Arg Lys Lys Arg Tyr Phe Tyr Gln Pro

370 375 380

Asn Asp Leu Val Lys Tyr Asn Asn Lys Ile Cys Val Val Lys Gly Thr

385 390 395 400

Phe Asn Lys Gly Ala Trp Val Met Leu Lys Leu Gly Lys Gly Lys Ser

405 410 415

Val Lys Thr Gly Asp Leu Lys Pro Tyr Lys Phe Ser Lys Gly Phe Ala

420 425 430

Leu Val

<210> 553

<211> 424

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-486 effector

<400> 553

Met Ser Asn Phe Val Phe Val Ile Asp Thr Asn Lys Arg Pro Leu Asn

1 5 10 15

Pro Ile His Pro Cys Leu Ala Arg Leu Leu Leu Thr Gln Gly Lys Ala
20 25 30

Ala Val Tyr Arg Arg Phe Pro Phe Ala Ile Ile Leu Lys Thr Thr Ser
35 40 45
Ile Glu Ala Thr His Pro Leu Gln Leu Lys Ile Asp Pro Gly Ser Gln
50 55 60
Thr Thr Gly Leu Ala Leu Val Ser Asn Glu Ala Val Ile Trp Gly Ala
65 70 75 80
Glu Leu Thr His Arg Gly Gln Ala Ile Lys Asn Ser Leu Glu Ser Arg
85 90 95

Leu Ala Ile Arg Arg Asn Arg Arg His Arg Lys Thr Arg Tyr Arg Gln
100 105 110
Pro Arg Phe Leu Asn Arg Thr Arg Lys Lys Gly Trp Leu Ala Pro Ser
115 120 125
Leu Glu His Arg Val Lys Thr Thr Leu Thr Trp Val Asn Arg Leu Arg
130 135 140
Lys Phe Ala Pro Ile Thr Gly Ile Ser Gln Glu Leu Val Arg Phe Asp
145 150 155 160

Leu Gln Gln Ile Asp Arg Pro Glu Ile Ser Gly Ile Glu Tyr Gln Gln
165 170 175
Gly Glu Leu Phe Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys Trp
180 185 190
Glu Arg Thr Cys Ala Tyr Cys Asn Lys Lys Asp Val Pro Leu Glu Val
195 200 205
Glu His Ile Thr Pro Lys Ser Lys Gly Gly Thr Asn Arg Ile Ser Asn
210 215 220

Leu Cys Ile Ala Cys His Asp Cys Asn Gln Lys Lys Gly Ala Ala Asp
225 230 235 240
Ile Lys Asp Phe Leu Asn Asn Gln Pro Glu Lys Leu Lys Lys Ile Leu
245 250 255
Ala Gln Ser Lys Gly Pro Leu Lys Asp Ala Ala Ala Val Asn Ser Thr

260 265 270

Arg Trp Glu Leu Tyr Arg Arg Leu Leu Ala Thr Gly Leu Pro Val Glu

275 280 285

Val Gly Thr Gly Gly Arg Thr Lys Phe Asn Arg Thr Lys Leu Gly Ile

290 295 300

Pro Lys Ser His Trp Leu Asp Ala Ala Cys Val Gly Ile Val Glu Lys

305 310 315 320

Leu Lys Ile Val Cys Ala Lys Pro Leu Leu Met Thr Ala Lys Gly Trp

325 330 335

Gly Asn Arg Gln Leu Cys Ile Thr Asn Lys His Gly Phe Pro Ile Arg

340 345 350

His Arg Thr Arg Gln Lys Ala Phe Phe Gly Phe Gln Thr Gly Asp Leu

355 360 365

Val Arg Ala Ile Leu Pro Val Gly Lys Glu Ala Gly Thr His Val Gly

370 375 380

Arg Leu Thr Val Arg Ala Thr Gly Val Phe Glu Met Val Thr Pro Leu

385 390 395 400

Gly Lys Val Ser Pro Val Arg Ala Lys Tyr Cys Arg Gly Val His Arg

405 410 415

Val Asp Gly Tyr Ser Tyr Val Ala

420

<210> 554

<211> 412

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-487 effector

<400> 554

Met Lys Pro Pro Trp Val His Pro Gly Thr Ala Arg His Leu Leu Asn

1 5 10 15

Ser Arg Glu Ala Ala Val Phe Arg Arg Phe Pro Phe Thr Ile Ile Leu
20 25 30

Lys Ala Ala Arg Pro Gln Thr Pro Val Gln Asp Leu Glu Leu Lys Leu
35 40 45
Asp Pro Gly Ser Lys Val Thr Gly Ile Ala Ile Lys Gln Gly Asn Asn
50 55 60
Ile Ile Phe Gly Ala Gln Leu Gln His Arg Gly Gln Gln Ile Lys Asp
65 70 75 80
Ala Leu Leu Ser Arg Arg Gln Leu Arg Arg Gly Arg Arg Asn Arg Lys
85 90 95

Thr Arg Tyr Arg Gln Ala Arg Phe Leu Asn Arg Thr Arg Pro Asp Gly
100 105 110
Trp Leu Ala Pro Ser Leu Gln His Arg Val Leu Ala Thr Met Thr Trp
115 120 125
Val Arg Lys Phe Ile Arg Leu Ala Pro Ile Thr Cys Leu Ala Gln Glu
130 135 140
Leu Val Arg Phe Asp Leu Gln Leu Met Gln Asn Pro Glu Ile Ser Gly
145 150 155 160

Val Glu Tyr Gln Gln Gly Glu Leu Lys Gly Tyr Glu Val Arg Glu Tyr
165 170 175
Leu Leu Glu Lys Trp Asn Arg Arg Cys Ala Tyr Cys Ser Val Glu Asn
180 185 190
Val Pro Leu Glu Val Glu His Ile Gln Pro Lys Ser Lys Gly Gly Ser
195 200 205
Ser Arg Val Ser Asn Leu Thr Ile Ala Cys His Gly Cys Asn Gln Gly
210 215 220

Lys Gly His Gln Asp Ile Arg Asp Phe Leu Ser Gly Lys Pro Asp Leu
225 230 235 240
Leu Asn Arg Ile Leu Lys Gln Ala Lys Ser Ser Leu Lys Asp Ala Ala
245 250 255
Ala Val Asn Ser Thr Arg Trp Val Val Phe Asn His Leu Lys Glu Thr

260 265 270

Gly Leu Pro Val Thr Thr Gly Thr Gly Gly Gln Thr Lys Phe Asn Arg

275 280 285

Thr Arg Leu Glu Leu Ser Lys Ser His Trp Leu Asp Ala Ala Cys Val

290 295 300

Gly Arg Ile Asp Gly Leu Glu Val Leu Thr Ser Lys Pro Leu Leu Ile

305 310 315 320

Leu Ala Lys Gly His Gly Thr Arg Gln Met Cys Gly Thr Asp Lys His

325 330 335

Gly Phe Pro Thr Arg His Arg Ser Arg Thr Gln Ile His Lys Gly Phe

340 345 350

Gln Thr Gly Asp Ile Val Lys Ala Thr Val Thr Ala Gly Lys Lys Ile

355 360 365

Gly Ser His Val Gly Arg Val Leu Cys Arg Ala Ser Gly Ser Phe Asp

370 375 380

Ile Ala Thr Thr Ala Ala Arg Val Ser Gly Ile Ser His Lys Tyr Cys

385 390 395 400

Lys Pro Ile His Lys Lys Asp Gly Tyr Ser Tyr Gly

405 410

<210> 555

<211

> 423

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-488 effector

<400> 555

Met Ser Asn Phe Ile Phe Val Leu Asp Thr Asn Lys Arg Pro Leu Thr

1 5 10 15

Pro Cys Lys Pro Ser Met Ala Arg Lys Leu Leu Thr Ala Gly Lys Ala

20 25 30

Ala Val Tyr Arg Arg Phe Pro Phe Thr Ile Ile Leu Lys Lys Val Val

35 40 45

Thr Ala Thr Ile Lys Ser Ile Asp Leu Lys Leu Asp Pro Gly Ser Lys

50 55 60

Thr Thr Gly Ile Ala Leu Leu Glu Gly Glu Lys Val Ile Phe Gly Ala

65 70 75 80

Glu Leu Thr His Arg Gly Gln Ala Ile Lys Ala Ser Leu Asp Ser Arg

85 90 95

Arg Ala Leu Arg Arg Gly Arg Arg Asn Arg His Thr Arg Tyr Arg Gln

100 105 110

Ala Arg Phe Leu Asn Arg Thr Arg Lys Lys Gly Trp Leu Ala Pro Ser

115 120 125

Leu Gln His Arg Val Glu Thr Thr Leu Thr Trp Val Asn Lys Leu Arg

130 135 140

Lys Leu Ala Pro Ile Asn Ser Ile Val Gln Glu Leu Val Arg Phe Asp

145 150 155 160

Leu Gln Gln Leu Glu Asn Leu Glu Ile Ser Gly Val Glu Tyr Gln Gln

165 170 175

Gly Glu Leu Gln Gly Tyr Glu Val Arg Glu Tyr Leu Leu Asn Lys Trp

180 185 190

Asn Arg Lys Cys Ala Tyr Cys Ser Val Glu Asn Ile Pro Leu Gln Ile

195 200 205

Glu His Ile Gln Pro Lys Ala Gln Gly Gly Ser Asn Arg Ile Ser Asn

210 215 220

Leu Cys Leu Ala Cys Glu Lys Cys Asn Gln Lys Lys Gly Thr Gln Asp

225 230 235 240

Ile Gln Arg Phe Leu Ala Lys Lys Pro Asp Ile Leu Lys His Ile Leu

245 250 255

Ala Gln Ala Lys Arg Pro Leu Lys Asp Ala Ala Ala Val Asn Ser Thr

260 265 270

Arg Trp Ala Leu Phe Ser Arg Leu Lys Glu Thr Gly Leu Pro Val Ala

275 280 285

Thr Gly Ser Gly Gly Leu Thr Lys Phe Asn Arg Thr Arg Leu Gln Leu

290 295 300

Pro Lys Thr His Trp Leu Asp Ala Ala Cys Val Gly Gln Leu Glu Ser

305 310 315 320

Leu Ser Val Val Thr Ser Lys Pro Leu Leu Ile Lys Ala Thr Gly His

325 330 335

Gly Thr Arg Gln Met Cys Arg Thr Asp Lys Phe Gly Phe Pro Ser Arg

340 345 350

Tyr Val Pro Arg Asn Lys Phe Val Lys Gly Phe Gln Thr Gly Asp Ile

355 360 365

Val Lys Ala Val Val Thr Ser Gly Lys Lys Ile Gly Glu Tyr Val Gly

370 375 380

Arg Val Ala Val Arg Ser Thr Gly Ser Phe Asn Ile Ser Ala Ser Glu

385 390 395 400

Leu Val Gln Gly Ile Ser His Lys Tyr Cys Lys Ile Val His His Lys

405 410 415

Asp Gly Tyr Ser Tyr Ser Phe

420

<210> 556

<211> 413

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-489 effector

<400> 556

Met Arg Gly Lys Pro Leu Met Pro Cys Ser Pro Ala Lys Ala Arg His

1 5 10 15

Met Leu Lys Ala Gly Lys Ala Val Val Leu Arg Arg Thr Pro Phe Thr

20 25 30

Ile Ser Leu Thr Val Ala Thr Gly Glu Thr Lys Gln Glu Val Thr Leu

35 40 45

Gly Val Asp Ala Gly Ala Glu His Val Gly Ile Ser Ala Thr Thr Glu

50 55 60

Lys Glu Glu Val Phe Ala Ser Glu Val Glu Leu Arg Gln Asp Ile Lys

65 70 75 80

Gly Leu Leu Ala Asp Arg Leu Glu Phe Arg Arg Ala Arg Arg Asn Arg

85 90 95

Lys Thr Arg Tyr Arg Ala Pro Arg Phe Asp Asn Arg Val Arg Ser Lys

100 105 110

His Lys Gly Trp Leu Ala Pro Ser Val Glu Asn Arg Ile Gln Ala His

115 120 125

Ile Ser Arg Ile Glu Ala Val Cys Arg Val Leu Pro Ile Thr Lys Ile

130 135 140

Val Ile Glu Thr Ala Ser Phe Asp Ile Gln Lys Ile Lys Asn Pro Glu

145 150 155 160

Val Glu Gly Thr Asp Tyr Leu Gln Gly Asp Gln Leu Gly Phe Trp Asn

165 170 175

Val Arg Glu Tyr Val Leu Phe Arg Asp Gly His Val Cys Arg His Cys

180 185 190

Arg Gly Arg Ser Lys Asp Pro Phe Leu Asn Val His His Leu Glu Ser

195 200 205

Arg Lys Thr Gly Gly Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu

210 215 220

Thr Cys His Lys Ala Tyr His Ala Gly Lys Ile Lys Leu Lys Ala Arg

225 230 235 240

Arg Gly Thr Pro Phe Arg Ala Glu Ala Phe Met Gly Ile Met Arg Trp

245 250 255

Thr Leu Leu Glu Arg Val Arg Lys Ala His Leu Glu Leu Pro Val Glu

260 265 270

Asn Thr Tyr Gly Tyr Leu Thr Lys His Lys His Ile Val Leu Gly Leu

275 280 285

Pro Lys Thr His Cys Ala Asp Ala Phe Cys Ile Ala Gly Asn Leu Ser

290 295 300

Ala Leu Arg Arg Gly Glu Phe Leu Tyr Gln Arg Gln Thr Arg Lys His

305 310 315 320

Asn Arg Gln Ile His Lys Cys Ser Ile Leu Lys Gly Gly Val Arg Lys

325 330 335

Leu His Gln Ala Pro Phe Leu Val Lys Gly Phe Arg Leu Phe Asp Lys

340 345 350

Val Lys Cys Lys Gly Arg Ile Gly Ile Ile Phe Gly Arg Arg Ser Ser

355 360 365

Gly Tyr Phe Asp Val Arg Thr Leu Asp Gly Val Arg Leu Ser Ala Gly

370 375 380

Ile Ser Ser Lys Lys Leu Met Leu Leu Glu Lys Gln Thr Thr Phe Leu

385 390 395 400

Thr Gln Leu Arg Lys Glu Val Gly Ala Ser Ser Pro Ser

405 410

<210> 557

<211> 421

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-490 effector

<400> 557

Met Val Tyr Val Leu Asn Arg Ile Gly Gln Pro Leu Met Pro Cys Lys

1 5 10 15

Glu Ala Lys Ala Arg Lys Leu Leu Lys Asn His Lys Ala Arg Val Asp

20 25 30

Lys Arg Glu Pro Phe Thr Ile Gln Leu Leu Phe Asp Cys Glu Asn Arg

35 40 45

Ile Gln Asp Ile Thr Leu Gly Ile Asp Ala Gly Ser Lys His Leu Gly
50 55 60
Leu Ser Ala Thr Thr Glu Gln Lys Glu Leu Tyr Ala Ala Asp Val Glu
65 70 75 80
Leu Arg Ser Asp Ile Val Glu Leu Leu Ser Thr Arg Arg Gln Tyr Arg
85 90 95
Arg Thr Arg Arg Gly Arg Leu Arg Tyr Arg Ala Pro Arg Phe Cys Asn
100 105 110

Arg Val Arg Ser Arg Asn Lys Gly Trp Leu Ala Pro Ser Val Glu Gln
115 120 125
Lys Ile Lys Thr His Leu Arg Val Val Asn Asp Val Cys Arg Ile Leu
130 135 140
Pro Val Ser Lys Ile Ile Val Glu Thr Ala Ala Phe Asp Val Gln Lys
145 150 155 160
Ile Glu Asn Pro Asp Ile Ser Gly Glu Gly Tyr Gln Gln Gly Ser Gln
165 170 175

Leu Asp Phe Trp Asn Val Arg Glu Tyr Val Leu Trp Arg Asp Asn His
180 185 190
Glu Cys Gln Cys Cys His Gly Lys Ser Met Asp Lys Ile Leu Asn Val
195 200 205
His His Ile Glu Ser Arg Lys Thr Gly Gly Asp Ser Pro Lys Asn Leu
210 215 220
Ile Thr Leu Cys Lys Asn Cys His Asp Gln Tyr His Met Gly Lys Ile
225 230 235 240

Asn Pro Asn Leu Lys Cys Arg Glu Pro Leu Arg Asp Ala Ala Phe Met
245 250 255
Gly Ile Met Arg Trp Ser Phe Tyr Asn Arg Leu Lys Asn Glu Tyr Leu
260 265 270
Asn Val Ser Met Thr Tyr Gly Tyr Ile Thr Lys Asn Thr Arg Ile Gln
275 280 285

His Asp Leu Pro Lys Glu His Tyr Thr Asp Ala Arg Cys Ile Ser Gly
290 295 300

Asn Pro Gln Ala Glu Pro Leu Gly Tyr Tyr Phe Cys Gln Lys Lys Val
305 310 315 320
Arg Cys His Asn Arg Gln Ile His Lys Ala Asn Ile Gln Lys Gly Gly
325 330 335
Ile Arg Lys Arg Asn Gln Ala Ala Tyr Leu Val Lys Gly Phe Arg Leu
340 345 350
Phe Asp Lys Val Arg Tyr Asp Asn Gln Ala Gly Phe Val Phe Gly Arg
355 360 365

Arg Ala Asn Gly Tyr Phe Asp Leu Arg Lys Leu Asn Gly Glu Val Ile
370 375 380
His Arg Ser Ala Ser Tyr Lys Lys Leu Glu Leu Leu Asp Thr Arg Lys
385 390 395 400
Thr Leu Leu Thr Glu Arg Arg Gln Ala Val Pro Leu Lys Ala Lys Ala
405 410 415
Met Ser Ile Pro Ala
420

<210> 558
<211> 424
<212> PRT
<213> Unknown
<220><223> Description of Unknown:

uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-491 effector
<400> 558
Met Ser Asn His Val Leu Val Leu Asp Thr Asn Tyr Lys Pro Leu Thr
1 5 10 15
Pro Cys Lys Ser Ser Thr Ala Arg Arg Leu Leu Asn Val Gly Lys Ala
20 25 30
Ala Val Phe Arg Arg His Pro Phe Thr Ile Ile Leu Lys Lys Glu Val

35 40 45

Asn Glu Val Gly Gln Pro Cys Gln Ile Lys Ile Asp Ser Gly Ser Lys
50 55 60
Thr Thr Gly Ile Ala Leu Leu Lys Gly Asn Gln Leu Val Trp Gly Ala
65 70 75 80
Glu Leu Thr His Arg Gly Gln Gln Ile Lys Asn Ala Leu Glu Ser Arg
85 90 95
Arg Ser Ile Arg Arg Asn Arg Arg Asn Arg Lys Thr Arg Tyr Arg Gln
100 105 110

Pro Arg Phe Leu Asn Arg Thr Arg Ala Thr Gly Trp Leu Ala Pro Ser
115 120 125
Leu Glu His Arg Val Leu Thr Thr Met Thr Trp Val Lys Arg Ile Met
130 135 140
Arg Phe Cys Ala Val Asp Ala Val Ala Gln Glu Leu Val Arg Phe Asp
145 150 155 160
Thr Gln Lys Met Gln Asn Phe Glu Ile Ser Gly Lys Glu Tyr Gln Gln
165 170 175

Gly Thr Leu Tyr Gln Tyr Glu Thr Arg Glu Tyr Leu Leu Glu Lys Phe
180 185 190
Asn Arg Thr Cys Val Tyr Cys Gly Ala Lys Asn Val Pro Leu Glu Val
195 200 205
Glu His Ile Arg Pro Lys Ser Lys Gly Gly Ser Asn Arg Ile Ser Asn
210 215 220
Leu Thr Ile Thr Cys Val Pro Cys Asn Gln Ala Lys Ser Asn Leu Ser
225 230 235 240

Ile Glu Glu Phe Leu Ser Asp Lys Pro Ser Leu Lys Glu Arg Ile Leu
245 250 255
Arg Lys Val Lys Ala Pro Leu Lys Asp Ala Ala Ala Val Asn Ser Thr
260 265 270
Arg Trp Ala Leu Trp Arg Ser Leu Asn Ala Leu Gly Ile Lys Leu Thr
275 280 285

Thr Gly Thr Gly Gly Gln Thr Lys Tyr Asn Arg Cys Arg Leu Gly Leu
290 295 300

Pro Lys Thr His Trp Leu Asp Ala Ala Cys Val Gly Val Val Glu Ala
305 310 315 320
Leu Glu Val Leu Thr Asn Gln Pro Leu Leu Ile Lys Ala Thr Gly His
325 330 335
Gly Lys Arg Gln Met Cys Gly Thr Asp Lys Tyr Gly Phe Pro Lys Arg
340 345 350
His Cys Ser Asn Lys Val Val His Phe Gly Phe Lys Thr Gly Asp Ile
355 360 365

Val Arg Ala Asp Val Pro Lys Gly Lys Asn Gln Gly Val His Val Gly
370 375 380
Arg Val Thr Ile Arg Ala Lys Gly Ser Phe Asn Leu Lys Thr Ala Thr
385 390 395 400
Gly Met Val Gln Gly Val Asn Gln Lys Tyr Cys Asn Ile Ile His Lys
405 410 415
Lys Asp Gly Tyr Ser Tyr Ala Phe
420

<210> 559
<211> 437
<212> PRT
<213> Unknown

<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-492 effector
<400> 559
Met Ser Lys Val Phe Val Leu Asp Thr Asn Thr Arg Pro Leu Asp Pro
1 5 10 15
Val His Pro Gly Tyr Ala Arg Phe Leu Leu Lys Gln Gly Lys Ala Ala
20 25 30
Val Tyr Arg Arg Tyr Pro Phe Thr Leu Ile Leu Gln Lys Val Val Glu

35 40 45

Tyr Pro Pro Val Lys Pro Leu Arg Val Lys Leu Asp Pro Gly Ser Arg
50 55 60
Thr Thr Gly Ile Ala Ile Val Asn Asp Val Ser Gly Glu Val Val Phe
65 70 75 80
Ala Ala Glu Leu Ser His Arg Gly Gln Ala Val Lys Ala Ala Leu Asp
85 90 95
Ala Arg Arg Ala Val Arg Arg Ser Arg Arg Gln Arg Lys Asn Arg Tyr
100 105 110

Arg Lys Ala Arg Trp Ala Asn Arg Lys Asn Gln Lys Lys Asp Trp Leu
115 120 125
Pro Pro Ser Leu Glu Ser Arg Ile Ala Asn Ile Leu Thr Trp Val Arg
130 135 140
Arg Leu Ser Arg Tyr Cys Pro Ile Gln Ala Ile Ser Gln Glu Val Val
145 150 155 160
Arg Phe Asp Met Gln Leu Met Glu Arg Pro Glu Met Lys Gly Met Glu
165 170 175

Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Ala Arg Glu Tyr Leu Leu
180 185 190
Glu Lys Trp Gln Arg Ala Cys Ala Tyr Cys Gly Glu Lys Asp Ile Pro
195 200 205
Leu Gln Ile Glu His Ile His Pro Arg Ala Lys Gly Gly Thr Asn Arg
210 215 220
Met Ser Asn Leu Cys Leu Ala Cys Glu Lys Cys Asn Arg Ala Lys Gly
225 230 235 240

Thr Gln Asp Ile Ala Val Phe Leu Lys Lys Lys Pro Glu Val Leu Lys
245 250 255
Arg Ile Gln Ala Gln Ala Arg Gln Pro Leu Lys Asp Ala Ala Ala Val
260 265 270
Asn Ala Thr Arg Trp Ala Leu Phe Glu Arg Leu Gln Ala Thr Gly Leu
275 280 285

Pro Val Glu Phe Gly Ser Gly Gly Leu Thr Lys Tyr Asn Arg Thr Thr
290 295 300

Arg Lys Leu Pro Lys Thr His Trp Leu Asp Ala Val Cys Val Gly Lys
305 310 315 320
Ser Thr Pro Glu Arg Leu Gln Val Asn Gly Ile Val Pro Leu Leu Ile
325 330 335
Thr Ala Thr Gly His Gly Ser Arg Gln Met Cys Gly Val Asn Lys Tyr
340 345 350
Gly Phe Pro Ile Arg His Arg Gln Arg Gln Lys Arg Tyr Phe Gly Tyr
355 360 365

Gln Thr Gly Asp Met Ile Arg Ala Val Val Thr Ser Arg Lys Asn Lys
370 375 380
Gly Val Tyr Val Gly Arg Val Leu Val Arg Ala Thr Gly Ser Phe Asp
385 390 395 400
Ile Arg Thr Lys Gln Gly Arg Val Gln Gly Ile Ser His Arg Phe Cys
405 410 415
Thr Pro Ile His Arg Cys Asp Gly Tyr Ser Tyr Gln Gln Gly Ala Gly
420 425 430

His Ser Phe Pro Ala
435

<210> 560
<211> 448
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-493 effector
<400> 560
Met Ser Asn Val Phe Val Val Asp Thr Tyr Gln Arg Pro Leu Asn Pro
1 5 10 15
Val His Pro Gly Arg Ala Arg Ile Leu Leu Ser Glu Gly Lys Ala Ala

20 25 30

Val Phe Lys Arg Tyr Pro Phe Thr Ile Ile Leu Lys Ile Glu Val Gln
35 40 45
Glu Pro Ala Val Gln Pro Leu Arg Ile Lys Leu Asp Pro Gly Ser Lys
50 55 60
Thr Thr Gly Leu Ala Ile Val Asn Asp Ala Thr Gly Glu Val Val Phe
65 70 75 80
Ala Ala Glu Leu Ser His Arg Gly Gln Lys Ile Lys Ala Ala Leu Asp
85 90 95

Asp Arg Arg Thr Val Arg Arg Ser Arg Arg Gln Arg Lys Thr Arg Tyr
100 105 110
Arg Lys Pro Arg Phe Asn Asn Arg Lys Asn Lys Lys Lys Gly Trp Leu
115 120 125
Pro Pro Ser Leu Glu Ser Arg Ile Ala Asn Val Leu Thr Trp Val Asn
130 135 140
Arg Met Ser Arg Ser Cys Arg Ile Thr Ala Ile Ser Met Glu Leu Val
145 150 155 160

Arg Phe Asp Met Gln Leu Met Gln Asn Ala Glu Val Ser Gly Val Glu
165 170 175
Tyr Gln Gln Gly Thr Leu Ala Gly Tyr Glu Ile Arg His Tyr Leu Leu
180 185 190
Glu Lys Trp Asp Arg Thr Cys Ser Tyr Cys Gly Ser Lys Asp Met Pro
195 200 205
Leu Gln Ile Glu His Ile Gln Pro Arg Ala Asn Gly Gly Thr Asn Arg
210 215 220

Ile Ser Asn Leu Cys Leu Ala Cys Glu Ala Cys Asn Thr Ala Lys Gly
225 230 235 240
Thr Leu Asp Ile Ala Val Phe Leu Lys Lys Lys Pro Glu Val Leu Lys
245 250 255
Arg Ile Gln Ser Gln Ala Lys Lys Pro Leu Lys Asp Ala Ala Ala Val
260 265 270

Asn Ala Thr Arg Trp Ala Leu Phe Glu Arg Leu Lys Ala Thr Gly Leu
275 280 285

Pro Ile Glu Cys Gly Ser Gly Gly Leu Thr Thr Phe Asn Arg Thr Thr
290 295 300
Arg Ala Phe Gln Lys Thr His Trp Leu Asp Ala Ala Asn Val Gly Lys
305 310 315 320
Ser Thr Pro Asp Val Leu Ile Val Lys Asp Ile Val Pro Val Leu Ile
325 330 335
Thr Ala Thr Gly His Gly Ser Arg Gln Met Cys Arg Pro Asp Arg Tyr
340 345 350

Gly Phe Pro Arg Thr Ser Ala Lys Gly Asn Lys Lys Val Lys Gly Phe
355 360 365
Gln Thr Gly Asp Ile Ile Lys Ala Ile Val Thr Thr Gly Ile Lys Lys
370 375 380
Gly Thr Tyr Ile Gly Arg Val Ala Val Arg Ser Ser Gly Ser Phe Thr
385 390 395 400
Ile Val Thr Ser Thr Gln Thr Ile Gln Gly Ile Ser Tyr Arg Phe Cys
405 410 415

Arg Met Val His His Ser Asp Gly Tyr Ser Tyr Thr Lys Gly Ser Ala
420 425 430
Leu Leu Pro Met His Glu Cys Arg Gly Ile Arg Ala Ile Glu Lys Arg
435 440 445

<210> 561
<211> 471
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-494 effector
<400> 561

Met Arg Ser Gln Phe Leu Ala Leu Ser Phe Ala Ile Lys Gln Thr Tyr

1 5 10 15

Arg Val Glu Val Ser Val Val Asn Pro Lys Ser Phe Arg Asn Ile Ala

20 25 30

Lys Ala Asn Ile Thr Arg Lys Glu Thr Gln Ala Leu Ser Lys Val Phe

35 40 45

Val Leu Asp Thr Asn Lys Gln Pro Leu Asn Pro Ile His Ser Gly Arg

50 55 60

Ala Arg Met Leu Leu Ser Gln Gly Lys Ala Ala Val Phe Arg Arg Tyr

65 70 75 80

Pro Phe Thr Val Ile Leu Asn Lys Glu Val Val Asn Pro Lys Val Glu

85 90 95

Ser Leu Arg Val Lys Ile Asp Pro Gly Ala Lys Thr Thr Gly Leu Ala

100 105 110

Leu Val Asn Asp Ser Thr Gly Glu Val Val Trp Ala Ala Gln Leu Gln

115 120 125

His Arg Gly Phe Gln Ile Arg Asp Ala Leu Thr Ser Arg Arg Gln Leu

130 135 140

Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg Lys Pro Arg Phe

145 150 155 160

Leu Asn Arg Thr Arg Pro Glu Gly Trp Leu Pro Pro Ser Leu Asn Ser

165 170 175

Arg Val Ala Asn Ile Leu Thr Trp Val Asn Arg Leu Ser Ser Ile Ser

180 185 190

Gln Ile Thr Ala Ile Ser Gln Glu Leu Val Arg Phe Asp Thr Gln Gln

195 200 205

Met Glu Asp Ala Glu Ile Ser Gly Ile Gly Tyr Gln Gln Gly Thr Leu

210 215 220

Phe Gly Tyr Glu Ile Arg Glu Phe Leu Leu Glu Lys Trp Asn Arg Thr

225 230 235 240

Cys Ala Tyr Cys Gly Ala Lys Asp Lys Pro Leu Glu Ile Glu His Ile

245 250 255

Asn Ala Arg Ser Lys Gly Gly Ser Asn Arg Ile Ser Asn Leu Cys Leu

260 265 270

Ala Cys Thr Ser Cys Asn Gln Lys Lys Gly Asn Gln Asp Ile Lys Asp

275 280 285

Phe Leu Lys Gly Lys Pro Asp Leu Leu Lys Cys Ile Leu Ser Gln Ala

290 295 300

Lys Arg Pro Leu Ala Asp Thr Ala Ala Val Asn Ala Thr Arg Trp Asn

305 310 315 320

Leu Tyr Tyr Asn Leu Lys Lys Thr Gly Leu Pro Val Glu Val Gly Thr

325 330 335

Gly Gly Arg Thr Lys Tyr Asn Arg Thr Ile Arg Gly Leu Asp Lys Thr

340 345 350

His Tyr Trp Asp Ala Ala Cys Val Gly Ala Ser Thr Pro Glu Gln Leu

355 360 365

Ile Thr Ser Glu Val Lys Pro Leu Leu Ile Ala Ala Lys Gly His Gly

370 375 380

Thr Arg Gln Gln Cys Arg Thr Asp Lys Phe Gly Phe Pro Ser Arg Tyr

385 390 395 400

Cys Lys Arg Thr Lys Phe His Lys Gly Phe Gln Thr Gly Asp Ile Val

405 410 415

Lys Ala Val Val Thr Ser Gly Lys Lys Ile Gly Thr Tyr Val Gly Arg

420 425 430

Leu Ala Thr Arg Ala Thr Gly Ser Phe Asn Ile Ser Thr Thr Asp Gly

435 440 445

Leu Val Gln Gly Ile Ser His Lys Tyr Cys Leu Pro Leu His Lys Lys

450 455 460

Asp Gly Tyr Ser Tyr Ile Gln

465 470

<210> 562

<211> 461

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-495 effector

<400> 562

Met Ser Asn Phe Val Phe Val Leu Asp Thr Asn Lys Arg Arg Leu Asn
1 5 10 15
Pro Val His Pro Arg Glu Ala Arg Leu Met Leu Asn Gln Gly Lys Ala

20 25 30
Ala Val Phe Arg Lys Tyr Pro Phe Thr Ile Ile Leu Lys Glu Ser Cys
35 40 45
Pro Asp Val Leu Val Gln Asp Leu Glu Leu Leu Leu Asp Pro Gly Ser
50 55 60
Lys Val Thr Gly Ile Ala Ile Lys Gln Gly Asn Lys Val Leu Phe Gly
65 70 75 80
Ala Glu Val Gln His Arg Gly Gln Gln Ile Arg Asp Ala Leu Leu Ser

85 90 95
Arg Arg Gln Leu Arg Arg Gly Arg Arg Asn Arg Lys Thr Arg Tyr Arg
100 105 110
Gln Pro Arg Phe Leu Asn Arg Thr Arg Pro Ser Gly Trp Leu Ala Pro
115 120 125
Ser Leu Gln His Arg Val Leu Thr Thr Leu Thr Trp Val Arg Lys Phe
130 135 140
Ile Arg Leu Ala Pro Ile Ala Ser Leu Ala Gln Glu Leu Val Arg Phe

145 150 155 160
Asp Leu Gln Leu Met Gln Asn Ser Glu Val Ser Gly Val Glu Tyr Gln
165 170 175
Arg Gly Glu Leu Gln Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys
180 185 190
Trp Asn Arg Arg Cys Ala Tyr Cys Ser Val Glu Asn Val Pro Phe Glu

195 200 205

Val Glu His Ile Gln Pro Lys Ser Lys Gly Gly Ser Glu Arg Val Ser

210 215 220

Asn Leu Thr Ile Ala Cys His Asp Cys Asn Gln Ser Lys Gly Asn Gln

225 230 235 240

Asp Ile Arg Asp Phe Leu Ser Ser Lys Ser Asp Leu Leu Asn His Val

245 250 255

Leu Lys Gln Ala Lys Ser Pro Leu Lys Asp Ala Ala Ala Val Asn Ser

260 265 270

Thr Arg Trp Ala Leu Phe Asn Ala Leu Lys Ala Thr Gly Leu Pro Val

275 280 285

Thr Thr Gly Thr Gly Gly Gln Thr Lys Phe Asn Arg Thr Arg Leu Asn

290 295 300

Leu Pro Lys Ala His Trp Thr Asp Ala Ala Cys Val Gly Arg Ile Asp

305 310 315 320

Ser Leu Leu Ile Leu Thr Ser Lys Pro Leu Leu Ile Ala Ala Lys Gly

325 330 335

His Gly Thr Arg Gln Met Cys Arg Thr Asp Lys Tyr Gly Phe Pro Ser

340 345 350

Arg Tyr Val Pro Arg Asn Lys Phe Val Lys Gly Phe Gln Thr Gly Asp

355 360 365

Ile Val Lys Ala Ile Val Glu Lys Gly Lys Lys Ile Gly Gln Tyr Val

370 375 380

Gly Arg Val Ala Val Arg Ser Thr Gly Ser Phe Asn Ile Ser Thr Asn

385 390 395 400

Asn Gly Leu Val Gln Gly Ile Ser His Lys Tyr Cys Ser Ile Ile His

405 410 415

Arg Lys Asp Gly Tyr Asn Tyr Gly Phe Cys His Asp Ala Glu Phe Ile

420 425 430

Gln Arg Val Val Leu Pro Pro Arg Val Lys Thr Ser Arg Phe Pro Tyr

435 440 445

Ser Arg Arg Phe Leu Asp Glu Lys Thr Arg Arg Ser His
450 455 460

<210> 563

<211> 423

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-496 effector

<400> 563

Met Ser Asn His Val Phe Val Leu Asp Thr Asn Arg Arg Pro Leu Thr
1 5 10 15

Pro Cys Gln Pro Gly Val Ala Arg Ser Leu Leu Lys Ala Gly Lys Ala
20 25 30

Ser Val Phe Arg Arg Tyr Pro Phe Thr Ile Ile Leu Asn Lys Glu Val
35 40 45

His Gly Asn Pro Glu Pro Ile Glu Leu Lys Leu Asp Pro Gly Ser Lys
50 55 60

Val Thr Gly Ile Ala Leu Lys Gln Gly Asn Arg Ile Ile Phe Ala Ala
65 70 75 80

Glu Leu Gln His Arg Gly Gln Gln Ile Val Glu Ala Leu Arg Ser Arg
85 90 95

Arg Gln Leu Arg Arg Ser Arg Arg Asn Arg Lys Thr Gln Tyr Arg Pro
100 105 110

Ala Arg Phe Leu Asn Arg Thr Arg Pro Gln Gly Trp Leu Ala Pro Ser
115 120 125

Leu Gln His Arg Val Asp Thr Leu Met Thr Trp Val Asn Arg Phe Arg
130 135 140

Arg Leu Ala Pro Val Gly Arg Ile Val Gln Glu Leu Val Arg Phe Asp
145 150 155 160

Leu Gln Leu Met Glu Asn Pro Glu Ile Ser Gly Val Glu Tyr Gln Gln

165 170 175

Gly Ala Leu Gln Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys Trp
180 185 190
Gly Arg Thr Cys Ala Tyr Cys Gly Ala Lys His Val Pro Leu Glu Val
195 200 205
Glu His Ile Gln Pro Arg Ser Lys Gly Gly Ser Asp Arg Val Ser Asn
210 215 220
Leu Thr Ile Ala Cys His Ser Cys Asn Gln Ala Lys Gly Asn Gly Asp
225 230 235 240

Ile Arg Asp Phe Leu Ser Gly Gln Pro Asp Val Leu Ser Arg Leu Leu
245 250 255
Arg Gln Ala Lys Ser Pro Leu Asn Asp Ala Ala Ala Val Asn Ser Thr
260 265 270
Arg Trp Ala Leu Phe Asn Ala Leu Lys Ala Thr Gly Val Pro Val Thr
275 280 285
Thr Gly Thr Gly Gly Gln Thr Lys Phe Asn Arg Leu Arg Leu Asn Leu
290 295 300

Pro Lys Ala His Trp Leu Asp Ala Ala Cys Val Gly Asp Val Glu Ser
305 310 315 320
Leu Asp Ile Val Thr Ser Lys Pro Leu Leu Ile Leu Ala Lys Gly His
325 330 335
Gly Thr Arg Arg Met Cys Gly Thr Asn Lys Tyr Gly Phe Pro Thr Arg
340 345 350
His Arg Ser Arg Lys Gln Ile His Asn Gly Phe Gln Thr Gly Asp Ile
355 360 365

Val Thr Ala Thr Val Thr Ala Gly Lys Lys Ile Gly Ser Tyr Val Gly
370 375 380
Arg Val Leu Cys Arg Ala Ser Gly Ser Phe Asp Met Thr Thr Ala Ser
385 390 395 400
Gly Arg Val Thr Gly Ile Asn His Lys Tyr Cys Gln Pro Ile His Arg
405 410 415

Lys Asp Gly Tyr Ala Tyr Ala
420

<210> 564

<211> 434

<212> PRT

<213> Unknown

<220

><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-497 effector

<400> 564

Met Gln Asn Arg Val Phe Val Ile Asn Lys His Gly Lys Ala Leu Met
1 5 10 15

Pro Cys Lys Pro Arg Lys Ala Arg Ile Leu Leu Arg Asp Gly Lys Ala
20 25 30

Lys Val Leu Lys Lys Glu Pro Phe Thr Ile Gln Leu Leu Tyr Gly Ser
35 40 45

Thr Gly Tyr Lys Gln Asp Ile Ser Val Gly Ile Asp Ser Gly Gln Arg
50 55 60

Tyr Ile Gly Leu Ala Val Thr Ser Gln Asn Lys Val Leu Phe Gln Gly
65 70 75 80

Glu Val Glu Leu Arg Gln Asp Val Lys Lys Leu Ile Asp Thr Arg Arg
85 90 95

Thr Tyr Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg Lys Ser
100 105 110

Arg Phe Leu Asn Arg Ile Ala Lys Lys Lys Asp Asn Trp Leu Pro Pro
115 120 125

Ser Val Ala Ser Lys Val Asn His Asn Ile Asn Trp Ile Lys Arg Leu
130 135 140

Leu Ser Val Leu Pro Lys Ala Asp Leu His Ile Glu Val Gly Lys Phe
145 150 155 160

Asp Met Gln Lys Met Lys Asn Pro Glu Ile Asn Gly Glu Gly Tyr Gln

165 170 175

Gln Gly Asp Leu Tyr Gly Tyr Gln Thr Val Lys Gln Phe Val Leu Ala
180 185 190
Arg Asp Asn Tyr Thr Cys Gln Val Cys Lys Lys Lys Gly Gly Lys Phe
195 200 205
Lys Ile His His Ile Ile Tyr Arg Ser Leu Gly Gly Thr Asn Thr Val
210 215 220
Asp Asn Leu Ile Thr Val Cys Ser Asn Cys His Thr Thr Lys Asn His
225 230 235 240

Gln Thr Gly Ile Leu Ala Lys Trp Cys Lys Asp Lys Met Lys Val Asn
245 250 255
Lys Ser Tyr Lys Gly Ala Thr Phe Met Asn Ile Leu Lys Arg Arg Leu
260 265 270
Phe Leu Ala Phe Pro Gln Ala Lys Phe Gln Tyr Gly Ala Trp Thr Thr
275 280 285
Leu Gln Arg Val Asp Leu Asp Leu Thr Lys Ser His Tyr Asn Asp Ala
290 295 300

Val Ala Ile Ser Gly Ile Arg Lys Val Lys Ala Lys Pro Thr Ser Ile
305 310 315 320
Met Met Phe Lys Gln Phe Arg Lys Lys Lys Arg Ser Leu His Glu Ala
325 330 335
Thr Ala Arg Lys Gly Arg Lys Thr Pro Asn Ile Thr Ser Lys Arg Asn
340 345 350
Ala Lys Asn Thr Lys Tyr Ala Lys Gly Phe Trp Leu Asn Asp Tyr Val
355 360 365

Lys Ile Lys Asp Ser Asn Lys Lys Gly Tyr Ile Ser Gly Phe Met Ser
370 375 380
Lys Gly Thr Asn Val Arg Leu Arg Asp Ile Phe Gly Glu Tyr Val Ser
385 390 395 400
Asn Ser Asp Lys Ser Tyr Thr Ser Thr Lys Asn Ile Ser Leu Ile Asn
405 410 415

His Ser Asn Asn Trp Gln Lys Gln Val Ile Thr Glu Lys Gln Tyr Ile
420 425 430

Met Gly

<210> 565
<211> 390
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-498 effector
<400> 565
Met Leu Lys Ala Gly Lys Ala Val Val Val Arg Arg Thr Pro Phe Thr
1 5 10 15
Ile Lys Leu Thr Ile Ala Thr Gly Glu Thr Lys Gln Asp Val Thr Leu
20 25 30
Gly Val Asp Ala Gly Ala Arg His Val Gly Ile Ser Ala Thr Thr Lys

35 40 45
Lys Glu Glu Val Phe Ala Ser Glu Val Ala Leu Arg Gln Asp Ile Thr
50 55 60
Gly Leu Leu Ala Asp Arg Leu Ala Phe Arg Arg Ala Arg Arg Asn Arg
65 70 75 80
Lys Thr Arg Tyr Arg Ala Pro Arg Phe Asn Asn Arg Val Arg Ser Lys
85 90 95
His Lys Gly Trp Leu Ala Pro Ser Val Glu Asn Arg Ile Gln Ala His

100 105 110
Met Ser Arg Ile Asp Ala Val Cys Arg Leu Leu Pro Val Thr Lys Ile
115 120 125
Val Ile Glu Thr Ala Ser Phe Asp Val Gln Lys Ile Lys Asn Pro Thr
130 135 140
Ile Glu Gly Thr Asp Tyr Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn

145 150 155 160

Val Arg Glu Tyr Val Leu Phe Arg Asp Gly His Val Cys Gln His Cys

165 170 175

His Gly Arg Ser Arg Asp Lys Ile Leu Asn Val His His Leu Glu Ser

180 185 190

Arg Lys Thr Gly Gly Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu

195 200 205

Thr Cys His Lys Ala Tyr His Ala Gly Lys Ile Lys Leu Lys Val Lys

210 215 220

Arg Gly Gln Ser Phe Arg Ala Glu Ala Phe Met Gly Ile Met Arg Trp

225 230 235 240

Thr Leu Leu Asp Arg Val Arg Lys Thr His Pro Glu Leu Pro Val Glu

245 250 255

Asn Thr Tyr Gly Tyr Leu Thr Lys His Lys Arg Ile Ala Leu Gly Leu

260 265 270

Pro Lys Thr His Cys Ala Asp Ala Phe Cys Ile Thr Gly Asn Leu Asn

275 280 285

Ala Leu Arg Arg Gly Asp Phe Leu Phe Gln Arg Gln Thr Arg Lys His

290 295 300

Asn Arg Gln Ile His Lys Cys Ser Ile Leu Lys Gly Gly Val Arg Lys

305 310 315 320

Leu Asn Gln Ala Pro Phe Leu Val Lys Gly Phe Arg Leu Phe Asp Lys

325 330 335

Val Arg Ile Gly Gly Gln Ile Gly Phe Val Phe Gly Arg Arg Val Arg

340 345 350

Gly Ile Phe Asn Ile Arg Arg Leu Asp Lys Thr Val Ile Gly Thr Asp

355 360 365

Ile Asn Cys Lys Lys Leu Ser Leu Leu Glu Thr Arg Lys Thr Phe Leu

370 375 380

Thr Glu Leu Arg Lys Glu

385 390

<210> 566

<211> 421

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-499 effector

<400> 566

Met Arg Gly Gln Pro Leu Met Pro Cys Ser Pro Ala Lys Ala Arg His

1 5 10 15

Leu Leu Lys Ala Gly Lys Ala Ala Val Arg Arg Arg Thr Pro Phe Thr

20 25 30

Ile Gln Leu Arg Ile Ala Thr Gly Glu Thr Lys Gln Ser Val Thr Leu

35 40 45

Gly Val Asp Ala Gly Ala Lys His Val Gly Leu Ser Ala Ala Thr Glu

50 55 60

Lys Glu Glu Val Phe Ala Ser Glu Val Glu Leu Arg Gln Asp Ile Thr

65 70 75 80

Gly Leu Leu Ala Ala Arg Leu Leu Leu Arg Arg Glu Arg Arg Gln Arg

85 90 95

Lys Thr Arg Tyr Arg Ala Pro Arg Phe Leu Asn Arg Val Arg Ser Lys

100 105 110

His Lys Gly Trp Leu Ala Pro Ser Val Glu Asn Arg Ile Gln Ala His

115 120 125

Met Ser Arg Ile Asp Ala Ile Cys Gly Leu Leu Pro Val Thr Lys Ile

130 135 140

Val Ile Glu Thr Ala Ser Phe Asp Ile Gln Lys Ile Lys His Pro Asp

145 150 155 160

Val Glu Gly Thr Asp Tyr Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn

165 170 175

Val Arg Glu Tyr Val Leu Phe Arg Asp Gly His Val Cys Gln His Cys

180 185 190

His Gly His Ala Lys Asp Lys Ile Leu Asn Val His His Leu Glu Ser

195 200 205

Arg Gln Thr Gly Gly Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu

210 215 220

Thr Cys His Lys Ala Cys His Ala Gly Lys Ile Lys Leu Lys Val Lys

225 230 235 240

Arg Gly Gln Ser Phe Arg Ala Glu Ala Phe Met Gly Ile Met Arg Trp

245 250 255

Thr Leu Leu Asp Arg Val Arg Lys Ala His Pro Gly Leu Pro Val Glu

260 265 270

Asn Thr Tyr Gly Tyr Leu Thr Lys Asn Thr Arg Ile Thr Leu Gly Leu

275 280 285

Pro Lys Ala His Cys Val Asp Ala Tyr Cys Ile Ala Gly Asn Leu Lys

290 295 300

Ala Val Arg Arg Gly Val Tyr Leu His Gln Arg Gln Val Arg Lys His

305 310 315 320

Asn Arg Gln Ile His Lys Cys Thr Val Leu Ser Lys Thr Leu Lys Asp

325 330 335

Gly Thr Lys Ile Gly Tyr Arg Lys Leu Asn Gln Thr Pro His Leu Val

340 345 350

Lys Asn Phe Arg Leu Phe Asp Lys Val Arg Cys Leu Gly Gln Thr Gly

355 360 365

Phe Ile Phe Gly Arg Arg Ser Ser Gly Tyr Phe Asp Val Arg Arg Leu

370 375 380

Asp Gly Val Lys Ile Ser Ser Cys Ile Ser Tyr Arg Lys Leu Thr Leu

385 390 395 400

Leu Glu Lys Arg Ser Thr Cys Leu Thr Glu Leu Arg Lys Glu Asp Gly

405 410 415

Ala Ser Ser Pro Val

420

<210> 567

<211> 390

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-500 effector

<400> 567

Met Leu Lys Ala Gly Lys Ala Phe Val Val Arg Arg Thr Pro Phe Thr

1 5 10 15

Ile Lys Leu Thr Ile Ala Thr Gly Glu Thr Lys Gln Asp Val Thr Leu

20 25 30

Gly Val Asp Ala Gly Ala Arg His Val Gly Ile Ser Ala Thr Thr Glu

35 40 45

Lys Glu Glu Val Phe Ala Ser Glu Val Ala Leu Arg Gln Asp Ile Thr

50 55 60

Gly Leu Leu Ala Asp Arg Leu Ala Phe Arg Arg Ala Arg Arg Asn Arg

65 70 75 80

Lys Thr Arg Tyr Arg Ala Pro Arg Phe Asn Asn Arg Val Arg Ser Lys

85 90 95

His Lys Gly Trp Leu Ala Pro Ser Val Glu Asn Arg Ile Gln Ala His

100 105 110

Ile Ser Arg Ile Glu Ala Val Cys Arg Leu Leu Pro Val Thr Lys Ile

115 120 125

Val Ile Glu Thr Ala Ser Phe Asp Ile Gln Lys Ile Arg Asn Pro Glu

130 135 140

Val Glu Gly Thr Gly Tyr Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn

145 150 155 160

Val Arg Glu Tyr Val Leu Phe Arg Asp Gly His Ile Cys Gln His Cys

165 170 175

Arg Gly Arg Ser Lys Asp Pro Ile Leu Asn Val His His Leu Glu Ser

180 185 190

Arg Lys Thr Gly Gly Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu

195 200 205

Thr Cys His Lys Ala Tyr His Ala Gly Lys Ile Lys Leu Lys Val Lys

210 215 220

Arg Gly Gln Ser Phe Arg Ala Glu Ala Phe Met Gly Ile Met Arg Trp

225 230 235 240

Thr Leu Leu Asp Arg Val Arg Lys Thr His Pro Lys Leu Pro Val Glu

245 250 255

Asn Thr Tyr Gly Tyr Leu Thr Lys His Lys Arg Ile Ala Leu Gly Leu

260 265 270

Pro Lys Thr His Cys Ala Asp Ala Phe Cys Ile Ala Gly Asn Leu Lys

275 280 285

Ala Leu Arg Arg Gly Asp Phe Leu Phe Gln Gln Gln Thr Arg Lys His

290 295 300

Asn Arg Gln Ile His Lys Cys Ser Ile Leu Lys Gly Gly Val Arg Thr

305 310 315 320

Leu Asn Gln Ala Pro Phe Leu Val Lys Gly Phe Arg Leu Phe Asp Lys

325 330 335

Val Arg Ile Gly Gly Gln Ile Gly Phe Val Phe Gly Arg Arg Val Arg

340 345 350

Gly Thr Phe Asn Ile Arg Arg Leu Asp Lys Thr Val Ile Gly Thr Asp

355 360 365

Ile Asn Cys Lys Lys Leu Ser Leu Leu Glu Thr Arg Lys Thr Phe Leu

370 375 380

Thr Glu Leu Arg Lys Glu

385 390

<210> 568

<211> 390

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-501 effector
<400> 568

Met Leu Lys Ala Gly Lys Ala Phe Val Val Arg Arg Thr Pro Phe Thr
1 5 10 15
Ile Lys Leu Thr Ile Ala Thr Gly Glu Thr Lys Gln Asp Val Thr Leu
20 25 30
Gly Val Asp Ala Gly Ala Arg His Val Gly Ile Ser Ala Thr Thr Glu

35 40 45
Lys Glu Glu Val Phe Ala Ser Glu Val Ala Leu Arg Gln Asp Ile Thr
50 55 60
Gly Leu Leu Ala Asp Arg Leu Ala Phe Arg Arg Ala Arg Arg Asn Arg
65 70 75 80
Lys Thr Arg Tyr Arg Ala Pro Arg Phe Asn Asn Arg Val Arg Ser Lys
85 90 95
His Lys Gly Trp Leu Ala Pro Ser Val Glu Asn Arg Ile Gln Ala His

100 105 110
Ile Ser Arg Ile Glu Ala Val Cys Arg Leu Leu Pro Val Thr Lys Ile
115 120 125
Val Ile Glu Thr Ala Ser Phe Asp Ile Gln Lys Ile Arg Asn Pro Glu
130 135 140
Val Glu Gly Thr Gly Tyr Gln Gln Gly Asp Gln Leu Gly Phe Trp Asn
145 150 155 160
Val Arg Glu Tyr Val Leu Phe Arg Asp Gly His Ile Cys Gln His Cys

165 170 175
Arg Gly Arg Ser Lys Asp Pro Ile Leu Asn Val His His Leu Glu Ser
180 185 190
Arg Lys Thr Gly Gly Asp Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu
195 200 205
Thr Cys His Lys Ala Tyr His Ala Gly Lys Ile Lys Leu Lys Val Lys

210 215 220

Arg Gly Gln Ser Phe Arg Ala Glu Ala Phe Met Gly Ile Met Arg Trp

225 230 235 240

Thr Leu Leu Asp Arg Val Arg Lys Thr His Pro Lys Leu Pro Val Glu

245 250 255

Asn Thr Tyr Gly Tyr Leu Thr Lys His Lys Arg Ile Ala Leu Gly Leu

260 265 270

Pro Lys Thr His Cys Ala Asp Ala Phe Cys Ile Ala Gly Asn Leu Lys

275 280 285

Ala Leu Arg Arg Gly Asp Phe Leu Phe Gln Gln Gln Thr Arg Lys His

290 295 300

Asn Arg Gln Ile His Lys Cys Ser Ile Leu Lys Gly Gly Val Arg Lys

305 310 315 320

Leu Asn Gln Ala Pro Phe Leu Val Lys Gly Phe Arg Leu Phe Asp Lys

325 330 335

Val Arg Ile Gly Gly Gln Ile Gly Phe Val Phe Gly Arg Arg Val Arg

340 345 350

Gly Thr Phe Asn Ile Arg Arg Leu Asp Lys Thr Val Ile Gly Thr Asp

355 360 365

Ile Asn Cys Lys Lys Leu Ser Leu Leu Glu Thr Arg Lys Thr Phe Leu

370 375 380

Thr Glu Leu Arg Lys Glu

385 390

<210> 569

<211> 425

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-502 effector

<400> 569

Met Ser Asn Phe Ile Phe Val Leu Asp Thr Gln Lys Arg Pro Leu Asp

1 5 10 15

Pro Val His Pro Gly Lys Ala Arg His Leu Leu Asn Gln Gly Lys Ala

20 25 30

Ala Val Tyr Arg Arg Phe Pro Phe Thr Leu Ile Leu Lys Glu Ala His

35 40 45

Pro Asp Val Pro Val Gln Asp Leu Glu Leu Lys Leu Asp Pro Gly Ser

50 55 60

Lys Val Thr Gly Ile Ala Ile Lys Gln Gly Asn Lys Ile Ile Phe Gly

65 70 75 80

Ala Glu Leu Gln His Arg Gly Gln Gln Ile Lys Asp Ala Leu Leu Ser

85 90 95

Arg Arg Gln Leu Arg Arg Gly Arg Arg Asn Arg Lys Thr Arg Tyr Arg

100 105 110

Gln Pro Arg Phe Leu Asn Arg Asn Arg Pro Asp Gly Trp Leu Ala Pro

115 120 125

Ser Leu Lys His Arg Val Asp Thr Val Leu Thr Trp Val Asn Arg Leu

130 135 140

Arg Asn Leu Ala Pro Leu Gly Ser Ile Ala Gln Glu Leu Val Arg Phe

145 150 155 160

Asp Leu Gln Lys Leu Gln Asn Pro Glu Ile Ser Gly Ile Glu Tyr Gln

165 170 175

Gln Gly Glu Leu Gln Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys

180 185 190

Trp Gly Arg Lys Cys Thr Tyr Cys Gly Thr Lys Asp Val Pro Leu Glu

195 200 205

Val Glu His Ile His Pro Arg Ser Arg Gly Gly Thr Asp Arg Val Ser

210 215 220

Asn Leu Thr Met Ala Cys His Ala Cys Asn Gln Ser Lys Gly Asn Gln

225 230 235 240

Asp Ile Arg Asp Phe Leu Phe Gly Lys Pro Glu Leu Leu Gln Arg Ile

245 250 255

Leu Arg Lys Ala Lys Ala Pro Leu Lys Asp Ala Ala Ala Val Asn Ser

260 265 270

Thr Arg Trp Ala Leu Phe Asn Ala Leu Lys Ala Thr Gly Leu Pro Leu

275 280 285

Thr Thr Gly Thr Gly Gly Gln Thr Lys Phe Asn Arg Thr Arg Leu Asp

290 295 300

Leu Pro Lys Ala His Trp Leu Asp Ala Ala Cys Val Gly Gln Val Asp

305 310 315 320

Ala Leu Lys Val Leu Thr Ser Lys Pro Leu Leu Ile Thr Ala Lys Gly

325 330 335

His Gly Thr Arg Gln Met Cys Gly Thr Asp Lys Phe Gly Phe Ser Thr

340 345 350

Arg His Lys Ser Arg Val Gln Ile His Lys Gly Phe Gln Thr Gly Asp

355 360 365

Ile Val Arg Ala Thr Val Thr Ala Gly Lys Lys Ile Gly Phe Tyr Val

370 375 380

Gly Arg Val Leu Cys Arg Ala Ser Gly Ser Phe Asp Ile Ala Thr Ala

385 390 395 400

Thr Gly Arg Val Ala Gly Ile Ser His Lys Tyr Cys Lys Ala Met His

405 410 415

Lys Lys Asp Gly Tyr Ala Tyr Val Phe

420 425

<210> 570

<211> 423

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-503 effector

<400> 570

Met Ser Asn His Val Phe Val Leu Asp Ala Asn Arg Lys Pro Leu Thr

1 5 10 15

Pro Cys Lys Pro Gly Val Ala Arg Ser Leu Leu Lys Ala Gly Lys Ala

20 25 30

Ser Val Phe Arg Arg Tyr Pro Phe Thr Leu Ile Leu Lys Lys Glu Val

35 40 45

Asp Ala Asn Pro Glu Pro Ile Glu Ile Lys Leu Asp Pro Gly Ser Gln

50 55 60

Val Thr Gly Ile Ala Leu Lys Gln Gly Asp Arg Ile Ile Phe Gly Ala

65 70 75 80

Glu Leu Gln His Arg Ser Gln Gln Ile Lys Asp Ala Leu Leu Ser Arg

85 90 95

Arg Gln Leu Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg Gln

100 105 110

Ala Arg Phe Leu Asn Arg Thr Arg Pro Asn Gly Trp Leu Ala Pro Ser

115 120 125

Leu Gln His Arg Ile Asp Thr Thr Met Thr Trp Val Asn Arg Phe Arg

130 135 140

Arg Leu Ala Pro Ile Ala His Ile Ser Gln Glu Leu Val Arg Phe Asp

145 150 155 160

Leu Gln Leu Met Gln Asn Pro Glu Ile Ser Gly Ile Glu Tyr Gln Gln

165 170 175

Gly Glu Leu Pro Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys Trp

180 185 190

Asn Gln Lys Cys Ala Tyr Cys Gly Ala Lys Asn Val Ala Leu Glu Val

195 200 205

Glu His Ile His Pro Lys Ser Lys Gly Gly Thr Asp Arg Val Ser Asn

210 215 220

Leu Thr Leu Ala Cys His Ser Cys Asn Gln Ser Lys Gly Asn Gln Asp

225 230 235 240

Ile Arg Asp Phe Leu Ser Gly Lys Pro Asp Leu Leu Ser Arg Ile Leu

245 250 255

Arg Gln Ala Lys Ser Pro Leu Lys Asp Ala Ala Ala Val Asn Ser Thr

260 265 270

Arg Trp Ala Leu Leu Thr Ala Leu Lys Gln Thr Gly Leu Pro Val Ala

275 280 285

Thr Gly Thr Gly Gly Gln Thr Lys Phe Asn Arg Thr Arg Trp Glu Leu

290 295 300

Pro Lys Ala His Trp Leu Asp Ala Ala Cys Val Gly Lys Ile Glu Ser

305 310 315 320

Leu Glu Ile Leu Thr Ser Lys Pro Leu Leu Ile Ala Ala Lys Gly His

325 330 335

Gly Thr Arg Gln Met Cys Gly Thr Asp Lys Tyr Gly Phe Pro Thr Arg

340 345 350

His Arg Ser Arg Val Gln Ile His Lys Gly Phe Gln Thr Gly Asp Ile

355 360 365

Val Thr Ala Thr Val Met Thr Gly Lys Lys Ile Gly Ser Tyr Val Gly

370 375 380

Arg Val Leu Cys Arg Ala Ser Gly Ser Phe Asp Ile Thr Thr Ala Ser

385 390 395 400

Gly Arg Val Ala Gly Ile Ser His Lys Tyr Cys Lys Pro Ile His Arg

405 410 415

Lys Asp Gly Tyr Ala Tyr Ala

420

<210> 571

<211> 433

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-504 effector

<400> 571

Met Ser Asn Phe Val Phe Val Ile Asp Thr Asn Phe Gln Pro Leu Asn

1 5 10 15

Pro Val Pro Pro Gly Gln Ala Arg Arg Leu Leu Lys Ala Lys Gln Ala

20 25 30

Ala Val Tyr Arg Arg Tyr Pro Phe Thr Ile Ile Leu Lys Tyr Ala Val

35 40 45

Pro Ile Pro Asp Thr Asp Pro Tyr Arg Leu Lys Ile Asp Pro Gly Ser

50 55 60

Lys Thr Thr Gly Leu Ala Ile Val Gln Gly Glu Lys Val Ile Trp Gly

65 70 75 80

Ala Glu Leu Ala His Arg Gly Gln Gln Ile Lys Asn Asp Leu Glu Ser

85 90 95

Arg Arg Ala Ile Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg

100 105 110

Lys Pro Arg Phe Leu Asn Arg Thr Arg Gln Lys Gly Trp Leu Ala Pro

115 120 125

Ser Leu Asn Ser Arg Val Glu Asn Ile Leu Thr Trp Val Asn Arg Ile

130 135 140

Thr Arg Tyr Val Pro Ile Thr Gly Ile Ser Gln Glu Leu Val Lys Phe

145 150 155 160

Asp Leu Ala Ala Met Gln Asn Pro Glu Ile Ser Gly Lys Glu Tyr Gln

165 170 175

Gln Gly Glu Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys

180 185 190

Trp Gly Arg Lys Cys Ala Tyr Cys Gly Val Glu Asn Val Pro Phe Glu

195 200 205

Val Glu His Ile His Pro Lys Ser Arg Gly Gly Ser Asp Arg Ile Ser

210 215 220

Asn Leu Thr Ile Ala Cys His Ala Cys Asn Gln Val Lys Gly Asn Arg

225 230 235 240

Asp Val Lys Asp Phe Leu Ala Lys Lys Pro Asp Ile Leu Ser Arg Ile

245 250 255

Leu Arg Gln Ala Lys Leu Pro Leu Lys Asp Ala Ala Ala Val Asn Ser

260 265 270

Thr Arg Trp Ala Leu Phe Asn Arg Leu Lys Glu Thr Gly Leu Pro Val

275 280 285

Glu Thr Gly Thr Gly Gly Arg Thr Lys Tyr Asn Arg Val Arg Leu Asn

290 295 300

Leu Pro Lys Ala His Trp Leu Asp Ala Ala Cys Val Gly Asn Val Glu

305 310 315 320

Ser Leu Gln Met Leu Thr Ser Ala Pro Leu Leu Ile Ala Ala Lys Gly

325 330 335

Trp Gly Asn Arg Gln Met Cys Thr Thr Asn Gln Tyr Gly Phe Pro Val

340 345 350

Arg His Arg Thr Arg Cys Lys Thr Phe Phe Gly Phe Gln Thr Gly Asp

355 360 365

Met Val Arg Ala Ile Leu Pro Thr Gly Lys Phe Ala Gly Val His Val

370 375 380

Gly Arg Leu Thr Val Arg Glu Ser Gly Val Phe Glu Met Lys Thr Pro

385 390 395 400

Thr Ser Lys Val Ser Pro Val Arg His Lys Tyr Cys Lys Ser Ile His

405 410 415

Arg Asn Asp Glu Tyr Met Tyr Thr Phe Ser Thr Asn Val His Ala Leu

420 425 430

Pro

<210> 572

<211> 446

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-505 effector

<400> 572

Met Ala Val Tyr Val Leu Asp Lys Thr Gly Lys Pro Leu Met Pro Cys
1 5 10 15
Ser Glu Lys Arg Ala Arg Leu Leu Leu Glu Arg Ser Arg Ala Arg Val
20 25 30
His Arg Leu Leu Pro Phe Val Ile Arg Leu Thr Asp Arg Arg Gln Ala
35 40 45
Asp Cys Thr Leu Gln Pro Leu Ala Leu Lys Leu Asp Pro Gly Ser Arg
50 55 60

Phe Thr Ser Met Ala Leu Val Arg Arg Gln Gly Arg Arg Val Ser Val
65 70 75 80
Leu Ser Leu Leu Glu Leu Ile His Arg Gly Ala Ala Ile Arg Gln Ala
85 90 95
Leu Leu Gln Arg Ala Ala Phe Arg Arg Arg Arg Arg Ser Ala Asn Leu
100 105 110
Arg Tyr Arg Ala Pro Arg Phe Asp Asn Arg Thr Arg Pro Ala Gly Trp
115 120 125

Leu Pro Pro Ser Leu Arg His Arg Leu Asp Thr Ser Leu Ala Trp Val
130 135 140
Ala Arg Leu Arg Arg Trp Ala Pro Ile Ala Ser Leu Ala Val Glu Arg
145 150 155 160
Val Lys Phe Asp Leu Gln Ala Leu Gln Asn Pro Gly Ile Val Gly Ile
165 170 175
Glu Tyr Gln Gln Gly Thr Leu Gln Gly Tyr Glu Val Arg Glu Tyr Leu
180 185 190

Leu Glu Lys Trp Gly Arg Arg Cys Ala Tyr Cys Gly Thr Glu Gln Val
195 200 205
Pro Leu Glu Val Glu His Ile Val Pro Arg Ser Ala Gly Gly Ser Asp
210 215 220
Arg Val Ser Asn Leu Thr Leu Ala Cys Arg Thr Cys Asn Gln Asn Lys

225 230 235 240

Gly Asn Arg Pro Leu Glu Val Phe Leu Ala Arg Gln Pro Leu Arg Leu
245 250 255

Ala Arg Ile Met Ala Gln Ala Lys Ala Pro Leu Arg Asp Ala Ala Ala
260 265 270

Val Asn Ala Thr Arg Asn Ala Leu Phe Ala Ser Leu Leu Ala Thr Gly
275 280 285

Leu Ser Val Glu Ala Gly Ser Gly Gly Gln Thr Lys Phe Asn Arg Arg
290 295 300

Arg Leu Gly Leu Pro Lys Ser His Ala Leu Asp Ala Val Cys Val Gly
305 310 315 320

Glu Val Glu Ala Val Ala Gly Trp Gln Arg Pro Thr Leu Ala Ile Arg
325 330 335

Ala Thr Gly Arg Gly Glu Tyr Gln Arg Thr Arg Leu Thr Ala His Gly
340 345 350

Phe Pro Arg Gly Tyr Leu Thr Arg Arg Lys Arg His Phe Gly Phe Gln
355 360 365

Thr Gly Asp Arg Val His Ala Val Val Pro Thr Gly Lys Lys Ala Gly
370 375 380

Val His Arg Gly Arg Val Ala Val Arg Gln Thr Gly Ser Phe Asn Ile
385 390 395 400

Gln Thr Ala Gly Gly Val Val Gln Gly Ile Gly His Arg His Cys His
405 410 415

Leu Val Gln Arg Ala Asp Gly Tyr Gly Tyr Ser Leu Gln Ser Phe Asp
420 425 430

Ser Ala Gln Leu Glu Lys Glu Ala Ala Arg Ala Gly Ala Arg
435 440 445

<210> 573

<211> 423

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-506 effector
<400> 573

Met Ser Asn His Val Phe Val Leu Asp Thr Asn Arg Lys Pro Leu Thr
1 5 10 15
Pro Cys Lys Pro Gly Val Ala Arg Ser Leu Leu Lys Ala Gly Lys Ala
20 25 30
Ser Val Phe Arg Arg Tyr Pro Phe Thr Ile Ile Leu Lys Lys Glu Val

35 40 45
Asn Ala Asn Pro Glu Pro Ile Glu Val Lys Leu Asp Pro Gly Ser Lys
50 55 60
Val Thr Gly Ile Ala Leu Lys Gln Gly Asn Arg Ile Ile Phe Gly Ala
65 70 75 80
Glu Leu Gln His Arg Gly Arg Gln Ile Lys Asp Ala Leu Leu Ser Arg
85 90 95
Arg Gln Leu Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg Gln

100 105 110
Val Arg Phe Leu Asn Arg Thr Arg Pro Asp Gly Trp Leu Ala Pro Ser
115 120 125
Leu Gln His Arg Val Asp Thr Leu Ile Thr Trp Val Asn Arg Phe Arg
130 135 140
Arg Leu Ala Pro Val Ala Arg Ile Ala Leu Glu Leu Val Arg Phe Asp
145 150 155 160
Leu Gln Leu Met Gln Asn Pro Glu Ile Ser Gly Val Glu Tyr Gln Gln

165 170 175
Gly Glu Leu Pro Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys Trp
180 185 190
Gly Arg Lys Cys Val Tyr Cys Gly Thr Gln Asn Val Ala Leu Glu Val
195 200 205
Glu His Ile Gln Pro Gln Ser Lys Gly Gly Thr Asp Arg Val Ser Asn

210 215 220

Leu Thr Leu Ala Cys His Ser Cys Asn Gln Ser Lys Ser Asn Arg Asp

225 230 235 240

Ile Arg Asp Phe Leu Ser Ser Gln Pro Asp Leu Leu Ser Arg Ile Leu

245 250 255

Arg Gln Thr Lys Ser Pro Leu Lys Asp Ala Ala Ala Val Asn Ser Thr

260 265 270

Arg Trp Ala Leu Phe Asn Ala Leu Lys Ala Thr Gly Leu Pro Val Val

275 280 285

Thr Gly Thr Gly Gly Gln Thr Lys Phe Asn Arg Thr Arg Leu Glu Leu

290 295 300

Pro Lys Ala His Trp Leu Asp Ala Ala Cys Val Gly Glu Ile Glu Ser

305 310 315 320

Leu Glu Ile Leu Thr Ser Lys Pro Leu Leu Ile Ala Ala Lys Gly His

325 330 335

Gly Thr Arg Gln Met Cys Gly Thr Asn Lys Tyr Gly Phe Pro Thr Arg

340 345 350

His Arg Ser Arg Val Gln Val His Lys Gly Phe Arg Thr Gly Asp Ile

355 360 365

Val Ile Ala Thr Val Thr Ala Gly Lys Lys Ile Gly Ser Tyr Val Gly

370 375 380

Arg Val Leu Cys Arg Ala Ser Gly Ser Phe Asp Ile Thr Thr Ala Ser

385 390 395 400

Gly Arg Val Ala Gly Ile Ser His Lys Tyr Cys Lys Pro Ile His Arg

405 410 415

Lys Asp Gly Tyr Ala Tyr Ala

420

<210> 574

<211> 429

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-507 effector
<400> 574

Met Ser Asn Phe Val Phe Val Leu Asp Thr Asn Lys Arg Pro Leu Asp
1 5 10 15
Pro Val His Pro Gly Lys Ala Arg Arg Leu Leu Ser Thr Gly Asn Ala
20 25 30
Ala Val Phe Arg Arg Tyr Pro Phe Thr Ile Ile Leu Lys Gln Ala Tyr
35 40 45
Pro Glu Ile Pro Val Gln Asp Leu Glu Leu Lys Leu Asp Pro Gly Ser
50 55 60
Gln Val Thr Gly Ile Ala Val Val Gln Gly Thr Lys Val Ile Phe Gly
65 70 75 80
Ala Glu Leu Glu His Arg Gly Gln Gln Ile Lys Asp Ala Leu Leu Ser
85 90 95
Arg Arg Gln Leu Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg
100 105 110
Gln Ala Arg Phe Leu Asn Arg Thr Arg Pro Lys Gly Trp Leu Pro Pro
115 120 125
Ser Leu Gln His Arg Val Asp Thr Thr Met Thr Trp Val Asn Arg Phe
130 135 140
Arg Arg Leu Ala Pro Ile Ala Arg Ile Ala Gln Glu Leu Val Arg Phe
145 150 155 160
Asp Leu Gln Leu Ile Gln Asn Pro Glu Ile Ser Gly Ile Glu Tyr Gln
165 170 175
Gln Gly Glu Leu Gln Gly Tyr Glu Leu Arg Glu Tyr Leu Leu Glu Lys
180 185 190
Trp Asn Arg Lys Cys Ala Tyr Cys Gly Ala Glu Asn Leu Pro Leu Glu
195 200 205
Leu Glu His Ile His Pro Arg Ser Lys Gly Gly Thr Asp Arg Val Ser

210 215 220

Asn Leu Thr Leu Ala Cys His Ser Cys Asn Gln Ser Lys Ser Asn Arg

225 230 235 240

Asp Ile Arg Asp Phe Leu Ser Asp Lys Pro Ser Arg Leu Asn Arg Ile

245 250 255

Leu Lys Gln Ser Gln Ser Pro Leu Lys Asp Ala Ala Ala Val Asn Ser

260 265 270

Thr Arg Trp Ala Leu Phe Asn Ala Leu Lys Gln Thr Gly Leu Pro Val

275 280 285

Ala Thr Gly Thr Gly Gly Gln Thr Lys Phe Asn Arg Thr Arg Leu Asn

290 295 300

Leu Pro Lys Thr His Trp Leu Asp Ala Ala Ser Val Gly Lys Ile Asp

305 310 315 320

Ser Leu Lys Val Leu Thr Thr Asn Pro Leu Leu Ile Ala Ala Lys Gly

325 330 335

His Gly Thr Arg Gln Met Cys Gly Thr Asp Lys Phe Gly Phe Pro Lys

340 345 350

Arg His Arg Ser Arg Val Gln Ile His Gln Gly Phe Gln Thr Gly Asp

355 360 365

Ile Val Thr Ala Ile Val Thr Lys Gly Lys Lys Ile Gly Ser Tyr Val

370 375 380

Gly Arg Val Leu Cys Arg Ala Ser Gly Ser Phe Asp Ile Thr Thr Gln

385 390 395 400

Ser Gly Arg Val Ser Gly Ile Ser His Arg Tyr Cys Gln Pro Ile His

405 410 415

Lys Arg Asp Gly Tyr Ala Tyr Ala Phe Ala His Thr Leu

420 425

<210> 575

<211> 427

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-508 effector
<400> 575

Met Lys Gln Asn Arg Val Leu Val Leu Asp Lys Asn His His Pro Leu
1 5 10 15
Met Pro Cys His Pro Ala Arg Ala Arg Gln Leu Leu Lys Ala Gly Arg
20 25 30

Ala Ser Val Phe Arg Trp Tyr Pro Phe Thr Ile Ile Leu His Asp Arg
35 40 45
Asp Arg Gly Glu Val Gln Ser Val Arg Leu Lys Leu Asp Pro Gly Ala
50 55 60
Lys Val Thr Gly Ile Ala Val Thr Ala Ala Phe Gln Arg Gly Asp Thr
65 70 75 80
Val Val Trp Ala Ala Glu Leu His His Arg Gly Asp Gln Ile Arg Gln
85 90 95

Ala Leu Leu Thr Arg Arg Ala Leu Arg His Ala Arg Arg Asn Arg Lys
100 105 110
Thr Arg Tyr Arg Lys Pro Arg Phe Asp Asn Arg Arg Arg Pro Glu Gly
115 120 125
Trp Leu Pro Pro Ser Leu Val Ser Arg Val Glu Asn Val Val Thr Trp
130 135 140
Val Glu Arg Leu Arg Arg Phe Ala Pro Leu Thr His Leu Ser Met Glu
145 150 155 160

Leu Val Arg Phe Asp Thr Gln Lys Leu Gln Asp Pro Glu Ile His Gly
165 170 175
Val Glu Tyr Gln Gln Gly Thr Leu Phe Gly Tyr Glu Val Arg Glu Tyr
180 185 190
Leu Leu Glu Lys Trp Gly Arg Lys Cys Val Tyr Cys Gly Ala Glu Asp
195 200 205
Val Pro Leu Glu Val Glu His Val Val Pro Arg Ser Arg Gly Gly Thr

210 215 220

Asp Arg Val Ser Asn Leu Thr Val Ala Cys His Glu Cys Asn Gln Ala
225 230 235 240
Lys Gly Asn Gln Ser Leu Glu Glu Phe Leu His His Asp Pro Glu Arg
245 250 255
Leu Arg Gln Ile Lys Ala Gly Leu Lys Thr Ser Leu Lys Gly Ala Ala
260 265 270
Val Val Asn Ala Thr Arg Trp Ala Leu Phe Arg Arg Leu Gln Ala Thr
275 280 285

Gly Leu Pro Leu Glu Val Gly Ser Gly Gly Arg Thr Lys Tyr Asn Arg
290 295 300
Ala Val Gln Gly Tyr Pro Lys Ala His Trp Ile Asp Ala Ala Cys Val
305 310 315 320
Gly Glu Leu Gly Glu Arg Met Arg Leu His Pro Glu Met Gln Val Thr
325 330 335
Arg Ile Val Ala Lys Gly His Gly Thr Arg Arg Arg Cys Gly Thr Asp
340 345 350

Lys His Gly Phe Pro Ile Arg His Ala Pro Ala Ala Lys Ser Tyr Met
355 360 365
Gly Phe Arg Thr Gly Asp Leu Val Arg Ala Thr Ile Pro Arg Gly Lys
370 375 380
Asn Thr Gly Arg His Val Gly Arg Ile Ala Ile Arg His Arg Pro Ser
385 390 395 400
Phe Arg Leu Asn Gly Phe Asp Val His Pro Lys Tyr Leu Lys Ile Leu
405 410 415

Gln Arg Gly Asp Gly Tyr Ala Tyr Ala Thr Glu
420 425

<210> 576
<211> 424
<212> PRT
<213> Unknown

<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-509 effector
<400> 576

Met Ser Asn Phe Val Phe Val Ile Asp Thr Asn Lys Gln Met Leu Asn
1 5 10 15
Pro Val His Pro Gly Glu Ala Arg Cys Leu Leu Ser Gln Gly Lys Ala
20 25 30

Ala Val Phe Arg Arg Tyr Pro Phe Thr Ile Ile Leu Gln Glu Glu Ala
35 40 45
Glu Ser Glu Ile Lys Pro Leu Gln Leu Lys Ile Asp Pro Gly Ser Lys
50 55 60
Thr Thr Gly Leu Ala Ile Leu Asn Gly Ser Lys Val Ile Trp Ala Ala
65 70 75 80
Glu Leu Thr His Arg Gly Gln Ala Ile Lys Asn Ala Leu Leu Ser Arg
85 90 95

Arg Gln Leu Arg Arg Gly Arg Arg Asn Arg Lys Thr Arg Tyr Arg Ala
100 105 110
Pro Arg Phe Leu Asn Arg Thr Arg Ala Glu Gly Trp Leu Ala Pro Ser
115 120 125
Leu Met His Arg Val Lys Thr Thr Leu Thr Trp Val Asn Arg Leu Cys
130 135 140
Arg Tyr Ala Pro Val Ala Gly Ile Ser Gln Glu Leu Val Arg Phe Asp
145 150 155 160

Thr Gln Val Ile Gln Asn Pro Glu Ile Ser Gly Thr Glu Tyr Gln Gln
165 170 175
Gly Thr Leu Ala Gly Tyr Glu Val Arg Glu Tyr Leu Leu Glu Lys Trp
180 185 190
Gly Arg Lys Cys Ala Tyr Cys Lys Ala Glu Asn Thr Pro Leu Gln Ile
195 200 205
Glu His Ile Gln Pro Arg Ser Lys Gly Gly Ser Asp Arg Val Ser Asn

210 215 220

Leu Thr Leu Ala Cys Glu Pro Cys Asn Thr Ala Lys Ser Asn Leu Pro
225 230 235 240
Val Gln Glu Phe Leu Ser Gly Lys Ser Asp Arg Leu Lys Arg Ile Leu
245 250 255
Ala Gln Ala Lys Ala Pro Leu Lys Asp Ala Ala Ala Val Asn Ser Thr
260 265 270
Arg Trp Ala Leu Phe Asn Ala Leu Lys Glu Thr Gly Leu Pro Val Ser
275 280 285

Thr Gly Ser Gly Gly Gln Thr Lys Tyr Asn Arg Thr Arg Leu Asn Leu
290 295 300
Pro Lys Thr His Trp Leu Asp Ala Ala Cys Val Gly Arg Val Asn Gln
305 310 315 320
Leu Glu Ile Leu Thr Thr Gln Pro Leu Leu Ile Lys Ala Thr Gly His
325 330 335
Gly Thr Arg Gln Met Cys Gly Thr Asp Lys Tyr Gly Phe Pro Ser Arg
340 345 350

His Arg Ser Arg Val Gln Ile His Lys Gly Phe Gln Thr Gly Asp Ile
355 360 365
Ile Val Ala Asn Val Thr Ala Gly Lys Lys Ile Gly Ser Tyr Leu Gly
370 375 380
Arg Val Leu Cys Arg Ala Ser Gly Ser Phe Asp Ile Ala Thr Lys Asn
385 390 395 400
Gly Lys Val Ala Gly Ile Ser His Lys Tyr Cys Gln Ser Ile His Lys
405 410 415

Arg Asp Gly Tyr Ala Tyr Ala Phe
420

<210> 577
<211> 403
<212> PRT
<213> Unknown

<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-510 effector
<400> 577

Met Pro Cys Ser Pro Arg Lys Ala Arg Leu Leu Leu Lys Gln Asn Lys
1 5 10 15
Ala Lys Val Ile Lys Arg Glu Pro Phe Thr Ile Gln Leu Leu Tyr Gly
20 25 30

Ser Ser Gly Tyr Lys Gln Pro Val Asn Leu Gly Ile Asp Ala Gly Ser
35 40 45
Lys His Ile Gly Ile Ser Ala Thr Thr Glu Asn Lys Val Leu Phe Glu
50 55 60
Ala Glu Ile Glu Leu Arg Asp Asp Ile Val Lys Leu Leu Ala Asp Arg
65 70 75 80
Arg Gln Tyr Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg Gln
85 90 95

Ala Arg Phe Leu Asn Arg Lys Lys Pro Lys Gly Trp Leu Ala Pro Ser
100 105 110
Ile Gln Asn Lys Ile Glu Ser His Leu Lys Ile Ile Ala Met Ala His
115 120 125
Lys Ile Leu Pro Ile Thr Lys Thr Thr Ile Glu Val Ala Gln Phe Asp
130 135 140
Ile Gln Lys Ile Lys Asn Pro Glu Ile Gln Gly Lys Glu Tyr Gln Glu
145 150 155 160

Gly Val Gln Leu Gly Phe Trp Asn Asn Arg Glu Tyr Val Leu Trp Arg
165 170 175
Asp Gly His Lys Cys Lys Gly Lys Thr Asn Cys Lys Asn Lys Ile Leu
180 185 190
Asn Val His His Ile Glu Ser Arg Lys Ile Gly Gly Asp Ala Pro Asn
195 200 205
Asn Leu Ile Thr Leu Cys Glu Gln Cys His Asp Asp Tyr His Ala Gly

210 215 220

Lys Leu Lys Leu Asn Leu Lys Arg Gly Lys Ser Tyr Arg Asp Ala Ala
225 230 235 240
Phe Met Gly Ile Met Arg Trp Ala Val Tyr Asn Arg Leu Lys Ala Leu
245 250 255
Tyr Ser Asn Val Lys Leu Thr Tyr Gly Tyr Ile Thr Lys Asn Ala Arg
260 265 270
Ile Thr Asn Arg Leu Glu Lys Ser His Ile Ile Asp Ala Arg Cys Ile
275 280 285

Ser Gly Asn Pro Leu Ala Lys Pro Asp Asn Asn Tyr Tyr Tyr Phe Lys
290 295 300
Gln Val Arg Lys Gln Asn Arg Gln Leu His Lys Ala Asn Pro Lys Lys
305 310 315 320
Gly Ile Arg Gln Ala Asn Lys Ala Pro Arg His Val His Gly Tyr Gln
325 330 335
Leu Phe Asp Lys Val Gln Tyr Glu Gly Gln Glu Cys Phe Ile Phe Gly
340 345 350

Arg Arg Ser Ser Gly Tyr Phe Asp Leu Arg Lys Leu Asp Gly Thr Lys
355 360 365
Ile His Pro Ser Ala Asn Tyr Lys Lys Leu Arg Leu Leu Glu Arg Ala
370 375 380
Ser Thr Leu Leu His Glu Arg Arg Lys Gly Asn Ser Ser Pro Thr Tyr
385 390 395 400
Ala Ile Ala

<210> 578
<211> 416
<212> PRT
<213> Unknown
<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-511 effector

<400> 578

Met Val Tyr Val Leu Ser Gln His Gly Gln Pro Leu Met Pro Thr Glu
1 5 10 15

Asn His Ala Lys Val Arg Ala Leu Leu Lys His Gly Lys Ala Lys Val
20 25 30

Ile Gln Gly Cys Pro Phe Thr Ile Gln Leu Leu Tyr Glu Ser Thr Thr
35 40 45

His Thr Gln Lys Ile Asn Leu Gly Ile Asp Ala Gly Ser Lys Thr Ile
50 55 60

Gly Val Ser Ala Thr Thr Asp Ser Lys Val Leu Tyr Glu Ser Glu Val
65 70 75 80

Val Leu Arg Asn Asp Ile Val Glu Leu Leu Ser Gly Arg Arg Ala Leu
85 90 95

Arg Asn Ser Arg Arg Ser Arg Lys Thr Arg Tyr Arg Lys Pro Arg Phe
100 105 110

Asp Asn Arg Lys Lys Pro Asp Gly Trp Leu Ala Pro Ser Ile Arg Gln
115 120 125

Lys Ile Glu Thr His Val Thr Val Val Gly Asn Val Met Lys Ile Leu
130 135 140

Pro Val Thr Lys Ile Ile Val Glu Thr Ala Ser Phe Asp Ile Gln Lys
145 150 155 160

Ile Lys Asn Pro Glu Ile Glu Gly Val Gly Tyr Gln His Gly Glu Gln
165 170 175

Leu Asp Phe Trp Asn Val Arg Glu Tyr Val Leu Phe Arg Asp Gly His
180 185 190

Thr Cys Gln Cys Cys Lys Gly Lys Ser Lys Asp Asn Ile Leu Asn Val
195 200 205

His His Ile Glu Ser Arg Lys Thr Gly Gly Asn Ala Pro Asn Asn Leu
210 215 220

Ile Thr Leu Cys Glu Thr Cys His Lys Ala Tyr His Lys Gly Ile Ile

225 230 235 240

Thr Leu Pro Lys Glu Ile His Arg Gly Met Arg Phe Arg Asp Ala Ala
245 250 255
Phe Met Gly Ile Met Arg Trp Ala Phe Tyr Asp Arg Leu Lys Glu Leu
260 265 270
Tyr Asn Pro Leu Gly Ala Glu Val Ile Asn Thr Tyr Gly Tyr Ile Thr
275 280 285
Lys Asn Thr Arg Ile Glu His Gly Leu Pro Lys Glu His Tyr Val Asp
290 295 300

Ala Arg Cys Ile Ser Asp Asn Pro Ala Ala Lys Pro Leu Asp His Tyr
305 310 315 320
Tyr Phe Gln Lys Lys Val Arg Cys His Asn Arg Gln Ile His Lys Asn
325 330 335
Thr Ile Leu Lys Gly Gly Ile Arg Lys Arg Asn Gln Ala Ser Tyr Glu
340 345 350
Val Lys Gly Phe Arg Leu Tyr Asp Gln Val Leu Trp Lys Gly Gln Lys
355 360 365

Cys Phe Ile Phe Gly Arg Arg Ser Thr Gly Arg Met Asp Leu Arg Leu
370 375 380
Leu Asp Gly Thr His Ile Asn Ala Ser Val Gly His Lys Asn Leu Lys
385 390 395 400
Leu Leu Ser Met Arg Lys Asn Tyr Leu Ile Glu Gln Arg Lys Ala Gly
405 410 415

<210> 579
<211> 416
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors
<220><223> Description: MG35-512 effector

<400> 579

Met Val Tyr Val Leu Ser Gln His Gly Gln Pro Leu Met Pro Thr Glu
1 5 10 15

Asn His Ala Lys Val Arg Ala Leu Leu Lys His Gly Lys Ala Lys Val
20 25 30

Ile Gln Arg Cys Pro Phe Thr Ile Gln Leu Leu Tyr Glu Ser Thr Thr
35 40 45

His Thr Gln Lys Ile Asn Leu Gly Ile Asp Ala Gly Ser Lys Thr Ile
50 55 60

Gly Val Ser Ala Thr Thr Asp Ser Lys Val Leu Tyr Glu Ser Glu Val
65 70 75 80

Val Leu Arg Asn Asp Ile Val Glu Leu Leu Ser Gly Arg Arg Ala Leu
85 90 95

Arg Asn Ser Arg Arg Ser Arg Lys Thr Arg Tyr Arg Lys Pro Arg Phe
100 105 110

Asp Asn Arg Lys Lys Pro Asp Gly Trp Leu Ala Pro Ser Ile Arg Gln
115 120 125

Lys Ile Glu Thr His Val Thr Val Val Gly Asn Val Met Lys Ile Leu
130 135 140

Pro Val Thr Lys Ile Ile Val Glu Thr Ala Ser Phe Asp Ile Gln Lys
145 150 155 160

Ile Lys Asn Pro Glu Ile Glu Gly Glu Gly Tyr Gln His Gly Glu Gln
165 170 175

Leu Asp Phe Trp Asn Val Arg Glu Tyr Val Leu Phe Arg Asp Gly His
180 185 190

Thr Cys Gln Cys Cys Lys Gly Lys Ser Lys Asp Asn Ile Leu Asn Val
195 200 205

His His Ile Glu Ser Arg Lys Thr Gly Gly Asn Ala Pro Asn Asn Leu
210 215 220

Ile Thr Leu Cys Glu Thr Cys His Lys Ala Tyr His Lys Gly Ile Ile
225 230 235 240

Thr Leu Pro Lys Glu Ile His Arg Gly Met Arg Phe Arg Asp Ala Ala

245 250 255

Phe Met Gly Ile Met Arg Trp Ala Phe Tyr Asp Arg Leu Lys Glu Leu

260 265 270

Tyr Asn Pro Leu Gly Ala Glu Val Ile Asn Thr Tyr Gly Tyr Ile Thr

275 280 285

Lys Asn Thr Arg Ile Glu His Gly Leu Pro Lys Glu His Tyr Val Asp

290 295 300

Ala Arg Cys Ile Ser Asp Asn Pro Ala Ala Lys Pro Leu Asp His Tyr

305 310 315 320

Tyr Phe Gln Lys Lys Val Arg Cys His Asn Arg Gln Ile His Lys Asn

325 330 335

Thr Ile Leu Lys Gly Gly Ile Arg Lys Arg Asn Gln Ala Ser Tyr Glu

340 345 350

Val Lys Gly Phe Arg Leu Tyr Asp Gln Val Leu Trp Lys Gly Gln Lys

355 360 365

Cys Phe Ile Phe Gly Arg Arg Ser Thr Gly Arg Met Asp Leu Arg Leu

370 375 380

Leu Asp Gly Thr His Ile Asn Ala Ser Val Gly His Lys Asn Leu Lys

385 390 395 400

Leu Leu Ser Met Arg Lys Asn Tyr Leu Ile Glu Gln Arg Lys Ala Gly

405 410 415

<210> 580

<211> 416

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-513 effector

<400> 580

Met Val Tyr Val Leu Ser Gln His Gly Gln Pro Leu Met Pro Thr Glu
1 5 10 15
Asn His Ala Lys Val Arg Ala Leu Leu Lys His Gly Lys Ala Lys Val
20 25 30
Ile Gln Gly Cys Pro Phe Thr Ile Gln Leu Leu Tyr Glu Ser Thr Thr
35 40 45
His Thr Gln Lys Ile Asn Leu Gly Ile Asp Ala Gly Ser Lys Thr Ile
50 55 60

Gly Val Ser Ala Thr Thr Asp Ser Lys Val Leu Tyr Glu Ser Glu Val
65 70 75 80
Val Leu Arg Asn Asp Ile Val Glu Leu Leu Ser Gly Arg Arg Ala Leu
85 90 95
Arg Asn Ser Arg Arg Ser Arg Lys Thr Arg Tyr Arg Lys Pro Arg Phe
100 105 110
Asp Asn Arg Lys Lys Pro Asp Gly Trp Leu Ala Pro Ser Ile Arg Gln
115 120 125

Lys Ile Glu Thr His Val Thr Val Val Gly Asn Val Met Lys Ile Leu
130 135 140
Pro Val Thr Lys Ile Ile Val Glu Thr Ala Ser Phe Asp Ile Gln Lys
145 150 155 160
Ile Lys Asn Pro Glu Ile Glu Gly Ala Glu Tyr Gln His Gly Glu Gln
165 170 175
Leu Asp Phe Trp Asn Val Arg Glu Tyr Val Leu Phe Arg Asp Gly His
180 185 190

Thr Cys Gln Cys Cys Lys Gly Lys Ser Lys Asp Asn Ile Leu Asn Val
195 200 205
His His Ile Glu Ser Arg Lys Thr Gly Gly Asn Ala Pro Asn Asn Leu
210 215 220
Ile Thr Leu Cys Glu Thr Cys His Lys Ala Tyr His Lys Gly Ile Ile
225 230 235 240
Thr Leu Pro Lys Glu Ile His Arg Gly Met Arg Phe Arg Asp Ala Ala

245 250 255

Phe Met Gly Ile Met Arg Trp Ala Phe Tyr Asp Arg Leu Lys Glu Leu
260 265 270
Tyr Asn Pro Leu Gly Ala Glu Val Ile Asn Thr Tyr Gly Tyr Ile Thr
275 280 285
Lys Asn Thr Arg Ile Glu His Gly Leu Pro Lys Glu His Tyr Val Asp
290 295 300
Ala Arg Cys Ile Ser Asp Asn Pro Ala Ala Lys Pro Leu Asp His Tyr
305 310 315 320

Tyr Phe Gln Lys Lys Val Arg Cys His Asn Arg Gln Ile His Lys Asn
325 330 335
Thr Ile Leu Lys Gly Gly Ile Arg Lys Arg Asn Gln Ala Ser Tyr Glu
340 345 350
Val Lys Gly Phe Arg Leu Tyr Asp Gln Val Leu Trp Lys Gly Gln Lys
355 360 365
Cys Phe Ile Phe Gly Arg Arg Ser Thr Gly Arg Met Asp Leu Arg Leu
370 375 380

Leu Asp Gly Thr His Ile Asn Ala Ser Val Gly His Lys Asn Leu Lys
385 390 395 400
Leu Leu Ser Met Arg Lys Asn Tyr Leu Ile Glu Gln Arg Lys Ala Gly
405 410 415

<210> 581
<211> 954
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG102 effectors
<220><223> Description: MG102-1 effector
<400> 581
Met Gln Ser Arg Val Thr Leu Ser Ile Asp Phe Gly Tyr Lys Asn Ile

1 5 10 15

Gly Val Ala Leu Val Arg Asp Gln Asp Gly Ile Asn Thr Pro Leu Phe

20 25 30

Ala Gly Thr Leu Leu Tyr Asp Pro Phe Gln Leu Ser Thr Lys Val Gly

35 40 45

Pro Arg Ala Glu Leu Arg Arg Gly Arg Arg Thr Arg Lys Thr Lys Lys

50 55 60

His Arg Leu Asn Leu Leu Lys Lys Lys Leu Phe Asp Thr Asn Leu Pro

65 70 75 80

Glu Gly Ala Val Gln Glu Leu Ile Thr Phe Cys Arg Arg Arg Gly Tyr

85 90 95

Ser Ser Leu Phe Asp Val Lys Glu Pro Pro Lys Thr Gly Lys Val Asp

100 105 110

Ser Lys Glu Glu Ile Val Phe Arg Phe Ser Arg Glu Glu Phe Phe Glu

115 120 125

Ala Leu Glu Lys Gln Ile Asp Arg Leu Val Pro Asp Asp Lys Lys Glu

130 135 140

Lys Ala Leu Thr Leu Cys Glu Ala Ile Leu Asn Arg Ala Gly Glu Pro

145 150 155 160

Ser Arg Glu Ile Arg Pro Leu Arg Ile Asn Asn Arg Gly Ala Ser Arg

165 170 175

Cys Ala Trp Asp Gly Cys Glu Asn Val Thr Pro Arg Arg Asp Asn Ala

180 185 190

Leu Arg Asp Pro Leu Ser Gln Phe Val His Thr Val Phe Ala Ala Ser

195 200 205

Leu Arg Gly Asp Ala Thr Leu Gln Asp Glu Val Ala Arg Met Leu Asp

210 215 220

Arg Ile Ala Glu Leu Gly Lys Arg Leu Arg His Arg Gly Gly Thr Asn

225 230 235 240

Pro Asp Lys Glu Arg Lys Ala Leu Lys Ala Glu Ile Ser Glu Glu Leu

245 250 255

Lys Leu Leu Lys Lys Leu Tyr Gly Leu Ser Pro Asp Leu Thr Glu Glu

260 265 270

Ala Ala Thr Pro Trp Ala Lys Ile Arg Gln Asn Ile Thr Asn Leu Ile

275 280 285

Glu Gln Thr Gly Gly Arg Asn Arg Phe Cys Arg Tyr His Ser Ser Gln

290 295 300

Tyr Val Thr His Phe Met Glu Gly Lys Pro Leu Pro Phe Lys Ala Thr

305 310 315 320

Leu Thr Glu Arg Asp Leu Val Ser Arg Arg Glu Glu Ile Leu Phe Gln

325 330 335

Lys Met Trp Arg Tyr Ile Glu Ala Arg Ile Leu Pro Leu Val Pro Asp

340 345 350

Gly Ile Asp Arg Val Ile Val Glu Arg Thr Ala Ile Asp Leu Leu Gly

355 360 365

Gly Ser Arg Lys Gln Arg Gln Gly Ile Ile Asn Lys Glu Ala Leu Glu

370 375 380

Glu Met Tyr Gln His Gly Pro Arg Tyr Gly Phe Ser Asp Asp Leu Glu

385 390 395 400

Met Leu Arg Ala Glu Phe Asp Gly Leu Cys Val Tyr Cys Gly Arg Pro

405 410 415

Asn Ala Glu Leu Val Glu Arg Asp His Leu Leu Pro Gln Ser Lys Phe

420 425 430

Phe Phe Asp Ser Tyr Leu Asn Ile Val Pro Ala Cys Pro Pro Cys Asn

435 440 445

Arg Thr Leu Lys Gln Ala Ala Ser Pro Gly Gly Ala Ser Leu Arg Ile

450 455 460

His Glu Gln Ala Tyr Asp Ala Tyr Ser Lys Phe Met Ala Ser Lys Phe

465 470 475 480

Thr Asn Lys Pro Pro His Leu Phe His Thr Ile Lys Lys Gly Val Leu

485 490 495

Asn Leu Met Arg Glu Pro Gly Arg Val Trp Glu Ala Glu Gln Tyr Leu

500 505 510

Asn Leu Ile Ala Asn Gln Phe Ala Gln Val Val Gly Thr Gln Arg Gly

515 520 525

Pro Arg Pro Leu Ala Arg Tyr Leu Ser Gly Lys Ile Tyr Lys Arg Phe

530 535 540

Gly Glu Lys Pro Gln Ile Gly Phe Val Asn Gly Arg His Thr Ala Leu

545 550 555 560

Trp Arg Lys Ala Ala Tyr Pro Glu Phe Asp Lys Phe Arg Asp Lys Ala

565 570 575

Glu Gly Gly Val Ile Asn His Ala Leu Asp Ala Leu Leu Met Ala Cys

580 585 590

Asp Leu Pro Asp Leu Thr Ser Leu Glu Ala Arg Asn Leu Gln Pro Gly

595 600 605

Leu Met Tyr Trp Trp Val Asp Lys Val Arg Lys Ala Ala Pro Pro Lys

610 615 620

Gly Pro Asp Gly Ile Pro Val Ile Pro Glu Pro Arg Phe Ala Val Ala

625 630 635 640

Gly Phe Glu Lys Val His Pro Gly Asn Tyr Ile Glu Ala Glu Leu Ala

645 650 655

Lys Met Asn Trp Asn His Lys Asp Thr Lys Val Gln Arg Gln Gly Ala

660 665 670

Tyr Gly Trp Ser Lys Lys Glu Asp Leu Pro Val Gln Arg Val Thr Ala

675 680 685

Ala Gly Leu Ala Asp Glu Leu Arg Lys Ala Asn Lys Lys Thr Ser Pro

690 695 700

Glu Leu Arg Arg Ala Glu Val Asp Lys Ile Val Asn Val Ile Val His

705 710 715 720

Pro Gln Leu His Gln Thr Leu Lys Met Ala Asn Ile Gly Asp Thr Pro

725 730 735

Gly Leu Ser Thr Ala Glu Ala Leu Ala Leu Trp Leu Arg Lys Thr Ile

740 745 750

Arg Gly Asn Leu Ser Lys Ala Arg Phe Ser Ser His Pro Ala Asp Gln

755 760 765

Ser Arg Ala Lys Met Leu Gln Asp Phe Ile Asn Gly Gln Ser Asn Val

770 775 780

Ile Pro Ala Val Ile Ala Val Gln Ile Leu Tyr Pro Ser Phe Lys Ser

785 790 795 800

Asn Met Asp Leu Asn Arg Val Asp Pro Gln Ser Gly Arg Leu Val His

805 810 815

Arg Tyr Val Ala Asp Pro Ala Asn Val Ala Tyr Ile Val Thr Tyr Arg

820 825 830

Gly Ser Asn Gly Asp Val Lys Arg Asp Arg Pro Leu Thr Leu Lys Trp

835 840 845

Arg Gln Ser Gly Ala Val Ile Pro Gly Val Lys Leu Phe Gly Asp Val

850 855 860

Pro Glu Gly Pro Leu Arg Gly Arg Ala Leu Gly Glu Lys Thr Ile Asp

865 870 875 880

Gln Lys Glu Trp Lys Ser Ala Leu His Gln Tyr Leu Ile Arg Ala Gly

885 890 895

Ile Ala Glu Tyr Asn Phe Val Ser Gln Gly Asn Val Val Val Tyr Glu

900 905 910

Asp Gly Ser Glu Leu Tyr Ile Arg Asn Phe Ser Gly Ser Tyr Gly Phe

915 920 925

Lys Lys Ser Trp Phe Lys Gly Ile Lys Ala Val Arg Pro Ser Pro Leu

930 935 940

Thr Glu Arg Leu Ile Pro Asn Ala Lys Leu

945 950

<210> 582

<211> 946

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG102 effectors

<220><223> Description: MG102-2 effector

<400> 582

Met Val Thr Leu Gly Val Asp Tyr Gly Ala Ser Ser Val Gly Leu Ala
1 5 10 15

Leu Val Arg Ser Asp Glu Lys Gly His Asn Ile Pro Leu Phe Ala Gly
20 25 30

Thr Ile Arg Leu Asp Ala Arg Trp Leu Lys Glu Lys Val Glu Val Arg
35 40 45

Ala Gly Ile Arg Arg Leu Arg Arg Thr Lys Lys Thr Lys Arg His Arg
50 55 60

Leu Arg Gln Leu Glu Gln Ser Leu Thr Gln Ile Gly Leu Gly Ala Glu
65 70 75 80

Gln Ile Gln Ser Ile Val Arg Phe Ser Asn Arg Arg Gly Tyr Lys Ser
85 90 95

Leu Phe Asp Ala Gly Val Ala Asp Asp Asp His Asp Glu Ala Glu Leu
100 105 110

Thr Tyr Arg Phe Thr Arg Glu Glu Phe Phe Lys Ala Leu Gly Thr Glu
115 120 125

Leu Gln Ser Ile Ile Pro Asp Thr Ser Gln Arg Gln Lys Ala Leu Ser
130 135 140

Thr Cys Glu Thr Ile Leu Asn Arg Gln Gly Asp Arg Ser Leu Glu Ile
145 150 155 160

Arg Gln Ile Lys Ile Asp Asn Arg Gly Ala Ser Arg Cys Ala Trp Glu
165 170 175

Gly Cys Asn Arg Val Thr Pro Arg Ser Asp Asn Ala Leu Gly Glu Val
180 185 190

Leu Ser Gln Gln Ile Tyr Thr Val Phe Gln Ser Ala Leu Lys Val Asn
195 200 205

Pro Val Leu Cys Gln Lys Val Glu Thr Ala Thr His Glu Leu His Glu

210 215 220

Leu Ala Lys Arg Leu Arg Asn Ala Ser Gly Glu Ala Ala Ser Asn Glu

225 230 235 240

Lys Lys Ile Leu Arg Lys Arg Ala Arg Thr Ile Leu Arg Ala Leu Lys

245 250 255

Glu Leu Leu Tyr Thr Pro Ala Glu Gly Val Gly Asp Ala Glu Lys Ala

260 265 270

Trp Lys Tyr Ile Glu Thr Gly Ile Met Asn Ile Met Glu Ser Arg Leu

275 280 285

Gly Arg Asn Arg Tyr Cys Arg Glu His Ser Arg Glu Tyr Val Gln Thr

290 295 300

Ile Cys Ser Gly Lys Leu Val Pro Phe Lys Gln Thr Ile Ser Glu Ser

305 310 315 320

Asp Ile Ile Ser Arg Arg Glu Gln Ile Ala Tyr Ala Lys Leu Trp Arg

325 330 335

Tyr Ile Glu Ala Arg Ile Leu Pro Leu Thr Pro Gly Gly Ile Asp Arg

340 345 350

Ile Val Val Glu Arg Thr Ala Phe Asp Leu Leu Ala Gly Ser Arg Lys

355 360 365

Thr Ile Gln Lys Ala Thr Asp Gln Phe Lys Glu Glu Met Tyr Gln His

370 375 380

Gly Pro Met Tyr Gly Phe Glu Ser Val Pro Asp Met Leu Lys Glu Glu

385 390 395 400

Phe Gly Gly Leu Cys Ala Tyr Cys Gly Gln Ser Ser Ser Thr Leu Ile

405 410 415

Asp Val Asp His Ile Leu Pro His Ala Asp Phe Leu Phe Asp Ser Tyr

420 425 430

Leu Asn Ile Leu Pro Ala Cys Pro Lys Cys Asn Ser Asp Leu Lys Gly

435 440 445

Asp Arg Ser Val Ser Asp Ala Ser Leu Thr Ile His Pro Asp Ala Tyr

450 455 460

Arg Ala Tyr Ser Asp Tyr Leu Lys Lys Lys Phe Ser Thr Arg Pro Met
465 470 475 480
His Tyr Phe His Ser Ile Lys Lys Gly Val Leu Asn Leu Met Gln Asp
485 490 495
Ala Ser Arg Leu Trp Glu Ala Glu Arg Tyr Leu Ser Leu Ile Ala Arg

500 505 510
Gln Phe Gly Gln Ile Val Gln Ser Gln Arg Gly Pro Arg Pro Phe Ala
515 520 525
Arg Tyr Leu Ser Thr Lys Leu Ser Arg Arg Gln Gly Gln Ala Pro Ala
530 535 540
Ile Arg Phe Arg Asn Gly Arg His Thr Ala Leu Tyr Arg Arg Val Ala
545 550 555 560
Tyr Pro Asp Phe Gln Lys Gln Ala Glu Lys Ala Glu Gly Asn Val Leu

565 570 575
Asn His Ala Leu Asp Ala Ile Leu Leu Ala Ser Glu Leu Pro Asp Leu
580 585 590
Tyr Pro Val Glu Ala Leu Asn Leu Pro Leu Trp Gln Leu Lys Asn Trp
595 600 605
Ala Asp Thr Val Arg Ala Arg Ala Pro Lys Ser Gly Asp Glu Gly Val
610 615 620
Pro Ile Cys Pro Asp Gly Pro Gln Tyr Val Asp Gly Phe Glu Thr Val

625 630 635 640
His Pro Gly Gly Tyr Val Glu Val Asp Leu Arg Ser Met Arg Trp Asn
645 650 655
Gln Lys Asp Ser Met Thr His Lys Gln Asp Pro Tyr Gly Phe Ser Glu
660 665 670
Lys Thr Gly Met Pro Thr Lys Arg Gly Ser Ala Phe Asp Leu Tyr Thr
675 680 685
Lys Leu Lys Lys Glu Lys Asn Pro Ser Lys Val Lys Ser Arg Ile Ala

690 695 700
Leu Ile His His Pro Ala Leu Arg Lys Ala Leu Ser Glu Ser Leu Gln

705 710 715 720

Ser Asp Thr Thr Gly Ser Ser Ala Ala Glu Asn Leu Lys Thr Trp Leu

725 730 735

Arg Ile Ser Val Lys Asn Ser Leu Ala His Ser Arg Phe Ser Asn His

740 745 750

Pro Gly Asp Gln Ala Arg Arg Ser Glu Leu Glu Lys Phe Ile Thr Gln

755 760 765

Glu Asp Cys Pro Ile Pro Ser Val Ile Gly Val Lys Met Phe Asp Met

770 775 780

Gly Val Arg Gly Lys Ile Asp Met Lys Arg Leu Asp Arg Gln Thr Gly

785 790 795 800

Gly Ile Gly His Arg Tyr Met Thr Gln Pro Pro Asn Lys Gly Val Ile

805 810 815

Val Ala Tyr Pro Lys Arg Glu Asp Gly Lys Pro Asp Leu Thr Lys Pro

820 825 830

Cys Cys Val Tyr His Lys Gln Asp Leu Ser Met Thr Pro Glu Asn Ile

835 840 845

Ser Ile Phe Lys Pro Pro Pro Pro Ile Leu Ser Asp Gly Val Ile Leu

850 855 860

Gly Lys Lys Pro Tyr Asp Lys Gly Asp Arg Arg Lys Ala Leu Glu Lys

865 870 875 880

Tyr Leu Ser Asp Cys Gly Phe His Ser Tyr Val Tyr Leu Thr Pro Gly

885 890 895

Cys Thr Ile Arg Tyr Lys Asp Gly Asn Glu Trp Phe Val Arg Asn Phe

900 905 910

Asp Ser Ser Glu Asp Phe Lys Lys Gly Arg Leu Arg Glu Ile Ile Gly

915 920 925

Thr Arg Arg Thr Pro Phe Val Asp Ser Leu Ile Pro Leu Lys Val Leu

930 935 940

Ser Gln

945

<210> 583

<211> 1076

<

212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG102 effectors

<220><223> Description: MG102-3 effector

<400> 583

Met Ser Val Thr Leu Thr Ile Asp Pro Gly Ser Arg Asn Ile Gly Leu
1 5 10 15

Ala Leu Val Arg Ser Arg Ala Gly Asp Arg Pro Ser Ala Leu Tyr Ala
20 25 30

Ala Cys Ile Val Ala Glu Pro Lys Pro Leu Lys Glu Leu Val Val Arg

35 40 45

Arg Ala Gln Leu Arg Arg Met Arg Arg Thr Arg Lys Thr Arg Arg Arg
50 55 60

Arg Leu Arg Arg Leu Ala Asp Ala Leu Arg Gly Ile Ala Gly Ala Glu
65 70 75 80

Ala Ile Val Arg Phe Cys Arg Arg Arg Gly Tyr Ser His Asp Pro Lys
85 90 95

Arg Ala Arg Asp Gly Arg Gly Ala Asp Asp Ser Thr Gly Ala Asp Lys

100 105 110

Leu Leu Phe Asn Val Ser Arg Glu Asp Phe Phe Lys Ala Leu Glu Ala
115 120 125

Glu Val Gln Arg Val Ile Ala Glu Pro Asp Arg Gln Arg Val Leu Ala
130 135 140

Ala Cys Arg Arg His Leu Asn Ala Ala Arg Leu Pro Gly Arg Glu Leu
145 150 155 160

Arg Pro Pro Arg Phe Asp Asn Arg Ala Val Gly Arg Cys Arg Trp Gln

165 170 175

Asp Cys Pro Arg Arg Pro Arg Arg Arg Ala Asn Ala Val Lys Glu Asn

180 185 190

Leu Arg Gln Thr Leu Tyr Glu Trp Leu Lys Pro Val Phe Gly Glu Ala

195 200 205

Leu Ala Gly Leu Glu Gln Ala Glu Ala Ala Lys Ala Lys Ser Lys Met

210 215 220

Cys Ala Glu Leu Asp His Trp Cys Ser Leu Leu Ala Lys Leu Ala Ala

225 230 235 240

Glu Tyr Arg Lys Leu Ala Asp Glu Gln Pro Asp Gln Arg Asp Glu Lys

245 250 255

Ala Ile Lys Lys Val Ser Ala Leu Leu Glu Arg Arg Lys Asn Glu Leu

260 265 270

Tyr Gln Lys Ile Val Asp Trp Ala Gln Glu Asn Ala Pro Ala Lys Ala

275 280 285

Gly Arg Lys Phe Ala Glu Asp Phe Glu Ala Tyr Cys Asp Lys Lys Arg

290 295 300

Ser Lys Gly Lys Gln Lys Trp Glu Gly Val Ser Ala Ala Gly Ala Thr

305 310 315 320

Gln Ala Gly Ala Val Gly Gln Lys Lys Lys Lys Lys Lys Lys Lys Arg

325 330 335

Gly Phe Gly Asn Gln Leu Asp Asp Ile Val Val Lys Gly Arg Ala Gly

340 345 350

Arg Leu Gln Tyr Cys Arg Glu His Thr Glu Gln Tyr Ile Gln Tyr Phe

355 360 365

Leu Glu Gly Lys Pro Ile Pro Asn Arg Glu Asp Val Leu Asp Arg Asp

370 375 380

Ile Arg Ser Arg Arg Gln Lys Ile Val Phe Asp Arg Leu Trp Ala Leu

385 390 395 400

Ile Arg Gly Arg Leu Leu Pro Leu Ala Gly Gly Arg Ile Asp Arg Ile

405 410 415

Val Val Glu Arg Val Ala Phe Asp Val Leu Ala Gly Thr Phe Ala Asp

420 425 430

Cys Gln Glu Leu Phe Arg Thr Asp Glu Glu Lys Ala Ala Glu Met Tyr
435 440 445
Trp Phe Gly Pro Arg His Gly Phe Lys Asn Glu Leu Glu Met Leu Arg
450 455 460
Thr Glu Phe Ala Gly Arg Cys Ala Tyr Cys Gly Gln Gln Phe Gln Asp
465 470 475 480
Leu Glu Val Glu His Ile Leu Pro Arg Ser Arg Phe Pro Phe Asp Ser

485 490 495
Tyr Leu Val Lys Val Pro Ala Cys Arg Gln Cys Asn Met Lys Lys Gly
500 505 510
Gly Arg Ser Ile Leu Glu Ala Gln Met Arg Ile His Pro Asp Ala Tyr
515 520 525
Asp Ala Tyr Glu Gln Tyr Leu Glu Lys Arg Glu Val Arg His Tyr Phe
530 535 540
Cys Asp Ile Lys Lys Gly Val Leu Lys Leu Leu Thr Asn Gly Ala Gln

545 550 555 560
Asn Trp Gly Phe Glu Arg Leu Leu Gly Met Ile Ala His Asn Ile Phe
565 570 575
Glu Gln Gly Lys Ser Gln Asn Ala Pro Arg Ala Leu Gly Arg Trp Leu
580 585 590
Ala Gly Lys Leu Glu Arg Glu Thr Gly Val Arg Pro Lys Val Val Phe
595 600 605
Leu Ser Gly Arg His Thr Ala Ala Trp Arg Gln Gln Val Leu Pro Asp

610 615 620
Tyr Glu Lys Ala Ala Glu Lys Ala Glu Gly Lys Lys Arg Asn His Ala
625 630 635 640
Val Asp Ala Ile Leu Leu Gly Cys Asp Phe Pro Pro Val Ala Phe Leu
645 650 655
Asp Ser Gln Arg Lys Trp Trp Leu Ser Glu Asp Arg Leu Arg Arg Trp
660 665 670
Glu Glu Gln Val Lys Ala Ala Ala Pro Glu Leu Ala Asp Leu Ala Gly

675 680 685

Asp Gly Asp Ala Ala Pro Ala Arg Leu Pro Arg Val Glu Ala Pro Pro

690 695 700

Pro Ile Arg Phe Phe Glu Glu Asp Leu Gly Gly Gly Tyr Phe Lys Ile

705 710 715 720

Asp Leu Ser Ala Phe Gly Trp Asn Arg Arg Arg Gln Ser Gly Ala Lys

725 730 735

Val Asp Pro Val Arg Met Ile Thr Thr Ala Asn Gly Lys Leu Val Ala

740 745 750

Lys Arg Glu Pro Ala Gln Ala Val Leu Lys Asp Leu Leu Ala Glu Lys

755 760 765

Gln Arg Asp Lys Arg Ile Gly Leu Ile Ala Asn Arg Arg Leu Arg Gln

770 775 780

Leu Leu Gln Ser Asp Pro Ala Asn Ala Ala Arg Asn Tyr Val Leu Trp

785 790 795 800

Leu Gln Arg Gln Thr Ala Arg Gly Leu Arg Ala Ala Lys Met Gly Asn

805 810 815

His Pro Ala Asp Thr Lys Arg Arg Ala Met Leu Glu Gln Phe Ile Asn

820 825 830

Thr Pro Val Asp Asp Phe Leu Arg Pro Ser Lys Arg Arg Thr Ala Lys

835 840 845

Lys Ala Gln Gln Gln Thr Gln Ser Ser Asp Gly Arg Gly Asn Gly Gln

850 855 860

Ser Ala Ala Glu Gln Thr Ser Ala Ala Glu Ile Pro Ala Ile Ile Gly

865 870 875 880

Val Cys Cys Leu Ile Ala Gln Lys Tyr Thr Lys Tyr Asp Val Pro Arg

885 890 895

Cys Asp Arg Asn Gly Lys Pro Leu His Tyr Tyr Ala Ser Gln Pro Ala

900 905 910

Ile Arg Ala Leu Tyr Val Gly Tyr Lys Arg Arg Lys Asp Gly Arg Leu

915 920 925

Asp Arg Ser Lys Pro Glu Ile Phe Arg Val Asn Gln Val Trp Lys Val

930 935 940

Tyr Tyr Gly Pro Pro Gly Gln Asp Gln Asp Ser Pro Lys Ala Arg Lys

945 950 955 960

Val Ile Glu Lys Leu Gly Gln Asp Ser Pro Leu His Gly Arg Met Leu

965 970 975

Gly Gln Arg Gly Ser Trp Gln Glu Phe Arg Lys Arg Trp His Glu Ala

980 985 990

Phe Ala Arg Leu Trp Ala Asp Leu Gly Val Glu Lys Arg Phe Gln Ile

995 1000 1005

Ala Gln Gly Ala Val Ile Glu Lys Thr Asp Gly Thr Cys Phe Leu

1010 1015 1020

Val Arg Asn Phe Asp Asn Thr Glu Gly Trp Met Arg Gly Ser Pro

1025 1030 1035

Trp Lys Asp Ile Arg Arg Val Tyr Arg Ser Pro Leu His Tyr Leu

1040 1045 1050

Ser Ala Lys Ala Lys Ala Ala Phe Asp His Ser Ser Arg Ser Ala

1055 1060 1065

Ala Thr Val Ala Glu Thr Ile Asn

1070 1075

<210> 584

<211> 1076

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG102 effectors

<220><223> Description: MG102-4 effector

<400> 584

Met Ser Val Thr Leu Thr Ile Asp Pro Gly Ser Arg Asn Ile Gly Leu

1 5 10 15

Ala Leu Val Arg Ser Arg Ala Gly Asp Arg Pro Ser Ala Leu Tyr Ala

20 25 30

Ala Cys Ile Val Ala Glu Pro Lys Pro Leu Lys Glu Leu Val Val Arg

35 40 45

Arg Ala Gln Leu Arg Arg Met Arg Arg Thr Arg Lys Thr Arg Arg Arg

50 55 60

Arg Leu Arg Arg Leu Ala Asp Ala Leu Arg Gly Ile Ala Gly Ala Glu

65 70 75 80

Ala Ile Val Arg Phe Cys Arg Arg Arg Gly Tyr Ser His Asp Pro Lys

85 90 95

Arg Ala Arg Asp Gly Arg Gly Ala Asp Asp Ser Thr Gly Ala Asp Lys

100 105 110

Leu Leu Phe Asn Val Ser Arg Glu Asp Phe Phe Lys Ala Leu Glu Ala

115 120 125

Glu Val Gln Arg Val Ile Ala Glu Pro Asp Arg Gln Arg Val Leu Ala

130 135 140

Ala Cys Arg Arg His Leu Asn Ala Ala Arg Leu Pro Gly Arg Glu Leu

145 150 155 160

Arg Pro Pro Arg Phe Asp Asn Arg Ala Val Gly Arg Cys Arg Trp Gln

165 170 175

Asp Cys Pro Arg Arg Pro Pro Arg Arg Ala Asn Ala Val Glu Glu Asn

180 185 190

Leu Arg Gln Thr Leu Tyr Glu Trp Leu Lys Pro Val Phe Gly Glu Ala

195 200 205

Leu Ala Gly Leu Glu Gln Ala Glu Ala Ala Lys Ala Lys Ser Gln Met

210 215 220

Cys Ala Glu Leu Asp His Trp Cys Ser Leu Leu Ala Lys Leu Ala Ala

225 230 235 240

Glu Tyr Arg Lys Leu Ala Asp Glu Gln Pro Asp Gln Arg Asp Glu Lys

245 250 255

Ala Ile Lys Lys Val Ser Ala Leu Leu Glu Arg Arg Lys Asn Glu Leu

260 265 270

Tyr Gln Lys Ile Val Asp Trp Ala Gln Glu Asn Ala Pro Ala Lys Ala

275 280 285

Gly Arg Lys Phe Ala Glu Asp Phe Glu Ala Tyr Cys Asp Lys Lys Arg

290 295 300

Ser Lys Gly Lys Gln Lys Trp Glu Gly Val Ser Ala Ala Gly Ala Thr

305 310 315 320

Gln Ala Gly Ala Val Gly Gln Lys Lys Lys Lys Lys Lys Lys Lys Arg

325 330 335

Gly Phe Gly Asn Gln Leu Asp Asp Ile Val Val Lys Gly Arg Ala Gly

340 345 350

Arg Leu Gln Tyr Cys Arg Glu His Thr Glu Gln Tyr Ile Gln Tyr Phe

355 360 365

Leu Glu Gly Lys Pro Ile Pro Asn Arg Glu Asp Val Leu Asp Arg Asp

370 375 380

Ile Arg Ser Arg Arg Gln Lys Ile Val Phe Asp Arg Leu Trp Ala Leu

385 390 395 400

Ile Arg Gly Arg Leu Leu Pro Leu Ala Gly Gly Arg Ile Asp Arg Ile

405 410 415

Val Val Glu Arg Val Ala Phe Asp Val Leu Ala Gly Thr Phe Ala Asp

420 425 430

Cys Gln Glu Leu Phe Arg Thr Asp Glu Glu Lys Ala Ala Glu Met Tyr

435 440 445

Trp Phe Gly Pro Arg His Gly Phe Lys Asn Glu Leu Glu Met Leu Arg

450 455 460

Thr Glu Phe Ala Gly Arg Cys Ala Tyr Cys Gly Gln Gln Phe Gln Asp

465 470 475 480

Leu Glu Val Glu His Ile Leu Pro Arg Ser Arg Phe Pro Phe Asp Ser

485 490 495

Tyr Leu Val Lys Val Pro Ala Cys Arg Gln Cys Asn Met Lys Lys Gly

500 505 510

Gly Arg Ser Ile Leu Glu Ala Gln Met Arg Ile His Pro Asp Ala Tyr

515 520 525

Asp Ala Tyr Glu Gln Tyr Leu Glu Lys Arg Glu Val Arg His Tyr Phe

530 535 540

Cys Asp Ile Lys Lys Gly Val Leu Lys Leu Leu Thr Asn Gly Ala Gln

545 550 555 560

Asn Trp Gly Phe Glu Arg Leu Leu Gly Met Ile Ala His Asn Ile Phe

565 570 575

Glu Gln Gly Lys Ser Gln Asn Ala Pro Arg Ala Leu Gly Arg Trp Leu

580 585 590

Ala Gly Lys Leu Glu Arg Glu Thr Gly Val Arg Pro Lys Val Val Phe

595 600 605

Leu Ser Gly Arg His Thr Ala Ala Trp Arg Gln Gln Val Leu Pro Asp

610 615 620

Tyr Glu Lys Ala Ala Glu Lys Ala Glu Gly Lys Lys Arg Asn His Ala

625 630 635 640

Val Asp Ala Ile Leu Leu Gly Cys Asp Phe Pro Pro Val Ala Phe Leu

645 650 655

Asp Ser Gln Arg Lys Trp Trp Leu Ser Glu Asp Arg Leu Arg Arg Trp

660 665 670

Glu Glu Gln Val Lys Ala Ala Ala Pro Glu Leu Ala Asp Leu Ala Gly

675 680 685

Asp Gly Asp Ala Ala Pro Ala Arg Leu Pro Arg Val Glu Ala Pro Pro

690 695 700

Pro Ile Arg Phe Phe Glu Glu Asp Leu Gly Gly Gly Tyr Phe Lys Ile

705 710 715 720

Asp Leu Ser Ala Phe Gly Trp Asn Arg Arg Arg Gln Ser Gly Ala Lys

725 730 735

Val Asp Pro Val Arg Met Ile Thr Thr Ala Asn Gly Lys Leu Val Ala

740 745 750

Lys Arg Glu Pro Ala Gln Ala Val Leu Lys Asp Leu Leu Ala Glu Lys

755 760 765

Gln Arg Asp Lys Arg Ile Lys Leu Ile Ala Asn Arg Arg Leu Arg Gln

770 775 780

Leu Leu Gln Ser Asp Pro Ala Asn Ala Ala Arg Asn Tyr Val Leu Trp

785 790 795 800

Leu Gln Arg Gln Thr Ala Arg Gly Leu Arg Ala Ala Lys Met Gly Asn

805 810 815

His Pro Ala Asp Thr Lys Arg Arg Ala Met Leu Glu Gln Phe Ile Asn

820 825 830

Thr Pro Val Asp Asp Phe Leu Arg Ser Gly Lys Arg Arg Thr Ala Lys

835 840 845

Lys Ala Gln Gln Gln Thr Gln Ser Ser Asp Gly Arg Gly Ser Gly Gln

850 855 860

Ser Ala Ala Glu Gln Thr Ser Ala Ala Glu Ile Pro Ala Ile Ile Gly

865 870 875 880

Val Cys Cys Leu Ile Ala Gln Lys Tyr Thr Lys Tyr Asp Val Pro Arg

885 890 895

Cys Asp Arg Asn Gly Lys Pro Leu His Tyr Tyr Ala Ser Gln Pro Ala

900 905 910

Ile Arg Ala Leu Tyr Val Gly Tyr Lys Arg Arg Lys Asp Gly Arg Leu

915 920 925

Asp Arg Ser Lys Pro Glu Ile Phe Arg Val Asn Gln Val Trp Lys Val

930 935 940

Tyr Tyr Gly Pro Pro Gly Lys Asp Gln Asp Ser Pro Lys Ala Arg Lys

945 950 955 960

Val Ile Glu Lys Leu Gly Gln Asp Ser Pro Leu His Gly Arg Met Leu

965 970 975

Gly Gln Arg Gly Ser Trp Gln Glu Phe Arg Lys Arg Trp His Glu Ala

980 985 990

Phe Gly Arg Leu Trp Ala Asp Leu Gly Val Glu Lys Arg Phe Gln Ile

995 1000 1005

Ala Gln Gly Ala Val Ile Glu Lys Thr Asp Gly Thr Cys Phe Leu
1010 1015 1020
Val Arg Asn Phe Asp Asn Thr Glu Gly Trp Met Arg Gly Ser Pro
1025 1030 1035
Trp Lys Asp Ile Arg Arg Val Tyr Arg Ser Pro Leu His Tyr Leu

1040 1045 1050
Ser Ala Lys Ala Lys Ala Ala Phe Asp His Ser Ser Arg Ser Ala
1055 1060 1065
Glu Thr Val Ala Glu Thr Ile Asn
1070 1075

<210> 585
<211> 1076
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG102 effectors
<220><223> Description: MG102-5 effector
<400> 585
Met Ser Val Thr Leu Thr Ile Asp Pro Gly Ser Arg Asn Ile Gly Leu

1 5 10 15
Ala Leu Val Arg Ser Arg Ala Gly Asp Arg Pro Ser Ala Leu Tyr Ala
20 25 30
Ala Cys Ile Val Ala Glu Pro Lys Pro Leu Lys Glu Leu Val Val Arg
35 40 45
Arg Ala Gln Leu Arg Arg Met Arg Arg Thr Arg Lys Thr Arg Arg Arg
50 55 60
Arg Leu Arg Arg Leu Ala Asp Ala Leu Arg Gly Ile Ala Gly Ala Glu

65 70 75 80
Ala Ile Val Arg Phe Cys Arg Arg Arg Gly Tyr Ser His Asp Pro Lys
85 90 95
Arg Ala Arg Asp Gly Arg Gly Ala Asp Asp Ser Thr Gly Ala Asp Lys

100 105 110

Leu Leu Phe Asn Val Ser Arg Glu Asp Phe Phe Lys Ala Leu Glu Ala

115 120 125

Glu Val Gln Arg Val Ile Ala Glu Pro Asp Arg Gln Arg Val Leu Ala

130 135 140

Ala Cys Arg Arg His Leu Asn Ala Ala Arg Leu Pro Gly Arg Glu Leu

145 150 155 160

Arg Pro Pro Arg Phe Asp Asn Arg Ala Val Gly Arg Cys Arg Trp Gln

165 170 175

Asp Cys Pro Arg Arg Pro Pro Arg Arg Ala Asn Ala Val Glu Glu Asn

180 185 190

Leu Arg Gln Thr Leu Tyr Glu Trp Leu Lys Pro Val Phe Gly Glu Ala

195 200 205

Leu Ala Gly Leu Glu Gln Ala Glu Ala Ala Lys Ala Lys Ser Lys Met

210 215 220

Cys Ala Glu Leu Asp His Trp Cys Ser Leu Leu Ala Lys Leu Ala Ala

225 230 235 240

Glu Tyr Arg Lys Leu Ala Asp Glu Gln Pro Asp Gln Arg Asp Glu Lys

245 250 255

Ala Ile Lys Lys Val Ser Ala Leu Leu Glu Arg Arg Lys Asn Glu Leu

260 265 270

Tyr Gln Lys Ile Val Asp Trp Ala Gln Glu Asn Ala Pro Ala Lys Ala

275 280 285

Gly Arg Lys Phe Ala Glu Asp Phe Glu Ala Tyr Cys Asp Lys Lys Arg

290 295 300

Ser Lys Gly Lys Gln Lys Trp Glu Gly Val Ser Ala Ala Gly Ala Thr

305 310 315 320

Gln Ala Gly Ala Val Gly Gln Lys Lys Lys Lys Lys Lys Lys Lys Arg

325 330 335

Gly Phe Gly Asn Gln Leu Asp Asp Ile Val Val Lys Gly Arg Ala Gly

340 345 350

Arg Leu Gln Tyr Cys Arg Glu His Thr Glu Gln Tyr Ile Gln Tyr Phe
355 360 365
Leu Glu Gly Lys Pro Ile Pro Asn Arg Glu Asp Val Leu Asp Arg Asp
370 375 380
Ile Arg Ser Arg Arg Gln Lys Ile Val Phe Asp Arg Leu Trp Ala Leu

385 390 395 400
Ile Arg Gly Arg Leu Leu Pro Leu Ala Gly Gly Arg Ile Asp Arg Ile
405 410 415
Val Val Glu Arg Val Ala Phe Asp Val Leu Ala Gly Thr Phe Ala Asp
420 425 430
Cys Gln Glu Leu Phe Arg Thr Asp Glu Glu Lys Ala Ala Glu Met Tyr
435 440 445
Trp Phe Gly Pro Arg His Gly Phe Lys Asn Glu Leu Glu Met Leu Arg

450 455 460
Thr Glu Phe Ala Gly Arg Cys Ala Tyr Cys Gly Gln Gln Phe Gln Asp
465 470 475 480
Leu Glu Val Glu His Ile Leu Pro Arg Ser Arg Phe Pro Phe Asp Ser
485 490 495
Tyr Leu Val Lys Val Pro Ala Cys Arg Gln Cys Asn Met Lys Lys Gly
500 505 510
Gly Arg Ser Ile Leu Glu Ala Gln Met Arg Ile His Pro Asp Ala Tyr

515 520 525
Asp Ala Tyr Glu Gln Tyr Leu Glu Lys Arg Glu Val Arg His Tyr Phe
530 535 540
Cys Asp Ile Lys Lys Gly Val Leu Lys Leu Leu Thr Asn Gly Ala Gln
545 550 555 560
Asn Trp Gly Phe Glu Arg Leu Leu Gly Met Ile Ala His Asn Ile Phe
565 570 575
Glu Gln Gly Lys Ser Gln Asn Ala Pro Arg Ala Leu Gly Arg Trp Leu

580 585 590
Ala Gly Lys Leu Glu Arg Glu Thr Gly Val Arg Pro Lys Val Val Phe

595 600 605

Leu Ser Gly Arg His Thr Ala Ala Trp Arg Gln Gln Val Leu Pro Asp

610 615 620

Tyr Glu Lys Ala Ala Glu Lys Ala Glu Gly Lys Lys Arg Asn His Ala

625 630 635 640

Val Asp Ala Ile Leu Leu Gly Cys Asp Phe Pro Pro Val Ala Phe Leu

645 650 655

Asp Ser Gln Arg Lys Trp Trp Leu Ser Glu Asp Arg Leu Arg Arg Trp

660 665 670

Glu Glu Gln Val Lys Ala Ala Ala Pro Glu Leu Ala Asp Leu Ala Gly

675 680 685

Asp Gly Asp Ala Ala Pro Ala Arg Leu Pro Arg Val Glu Ala Pro Pro

690 695 700

Pro Ile Arg Phe Phe Glu Glu Asp Leu Gly Gly Gly Tyr Phe Lys Ile

705 710 715 720

Asp Leu Ser Ala Phe Gly Trp Asn Arg Arg Arg Gln Ser Gly Ala Lys

725 730 735

Val Asp Pro Val Arg Met Ile Thr Thr Ala Asn Gly Lys Leu Val Ala

740 745 750

Lys Arg Glu Pro Ala Gln Ala Val Leu Lys Tyr Leu Leu Ala Glu Lys

755 760 765

Gln Arg Asp Lys Arg Ile Lys Leu Ile Ala Asn Arg Arg Leu Arg Gln

770 775 780

Leu Leu Gln Ser Asp Pro Ala Asn Ala Ala Arg Asn Tyr Val Leu Trp

785 790 795 800

Leu Gln Arg Gln Thr Ala Arg Gly Leu Arg Ala Ala Lys Met Gly Asn

805 810 815

His Pro Ala Asp Thr Lys Arg Arg Glu Met Leu Glu Gln Phe Ile Asn

820 825 830

Thr Pro Val Asp Asp Phe Leu Arg Pro Ser Lys Arg Arg Thr Ala Lys

835 840 845

Lys Ala Gln Gln Gln Thr Gln Ser Ser Asp Gly Arg Gly Asn Gly Gln

850 855 860

Ser Ala Ala Glu Gln Thr Ser Ala Ala Glu Ile Pro Ala Ile Ile Gly

865 870 875 880

Val Cys Cys Leu Ile Ala Gln Lys Tyr Thr Lys Tyr Asp Val Pro Arg

885 890 895

Cys Asp Arg Asn Gly Lys Pro Leu His Tyr Tyr Ala Ser Gln Pro Ala

900 905 910

Ile Arg Ala Leu Tyr Val Gly Tyr Lys Arg Arg Lys Asp Gly Arg Leu

915 920 925

Asp Arg Ser Lys Pro Glu Ile Phe Arg Val Asn Gln Val Trp Lys Val

930 935 940

Tyr Tyr Gly Pro Pro Gly Lys Asp Gln Asp Ser Pro Lys Ala Arg Lys

945 950 955 960

Val Ile Glu Lys Leu Gly Gln Asp Ser Pro Leu His Gly Arg Met Leu

965 970 975

Gly Gln Arg Gly Ser Trp Gln Glu Phe Arg Lys Arg Trp His Glu Ala

980 985 990

Phe Ala Arg Leu Trp Ala Asp Leu Gly Val Glu Lys Arg Phe Gln Ile

995 1000 1005

Ala Gln Gly Ala Val Ile Glu Lys Thr Asp Gly Thr Cys Phe Leu

1010 1015 1020

Val Arg Asn Phe Asp Asn Thr Glu Gly Trp Met Arg Gly Ser Pro

1025 1030 1035

Trp Lys Asp Ile Arg Arg Val Tyr Arg Ser Pro Leu His Tyr Leu

1040 1045 1050

Ser Ala Lys Ala Lys Ala Ala Phe Asp His Ser Ser Arg Ser Ala

1055 1060 1065

Ala Thr Val Ala Glu Thr Ile Asn

1070 1075

<210> 586

<211> 1076

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG102 effectors

<220><223> Description: MG102-6 effector

<400> 586

Met Ser Val Thr Leu Thr Ile Asp Pro Gly Ser Arg Asn Ile Gly Leu

1 5 10 15

Ala Leu Val Arg Ser Arg Ala Gly Asp Arg Pro Ser Ala Leu Tyr Ala

20 25 30

Ala Cys Ile Val Ala Glu Pro Lys Pro Leu Lys Glu Leu Val Val Arg

35 40 45

Arg Ala Gln Leu Arg Arg Met Arg Arg Thr Arg Lys Thr Arg Arg Arg

50 55 60

Arg Leu Arg Arg Leu Ala Asp Ala Leu Arg Gly Ile Ala Gly Ala Glu

65 70 75 80

Ala Ile Val Arg Phe Cys Arg Arg Arg Gly Tyr Ser His Asp Pro Lys

85 90 95

Arg Ala Arg Asp Gly Arg Gly Ala Asp Asp Ser Thr Gly Ala Asp Lys

100 105 110

Leu Leu Phe Asn Val Ser Arg Glu Asp Phe Phe Lys Ala Leu Glu Ala

115 120 125

Glu Val Gln Arg Val Ile Ala Glu Pro Asp Arg Gln Arg Val Leu Ala

130 135 140

Ala Cys Arg Arg His Leu Asn Ala Ala Arg Leu Pro Gly Arg Glu Leu

145 150 155 160

Arg Pro Pro Arg Phe Asp Asn Arg Ala Val Gly Arg Cys Arg Trp Gln

165 170 175

Asp Cys Pro Arg Arg Pro Arg Arg Arg Ala Asn Ala Val Glu Glu Asn

180 185 190

Leu Arg Gln Thr Leu Tyr Glu Trp Leu Lys Pro Val Phe Gly Glu Ala
195 200 205
Leu Ala Gly Leu Glu Gln Ala Glu Ala Ala Lys Ala Lys Ser Lys Met
210 215 220
Cys Ala Glu Leu Asp His Trp Cys Ser Leu Leu Ala Lys Leu Ala Ala
225 230 235 240
Glu Tyr Arg Lys Leu Ala Asp Glu Gln Pro Asp Gln Arg Asp Glu Lys

245 250 255
Ala Ile Lys Lys Val Ser Ala Leu Leu Glu Arg Arg Lys Asn Glu Leu
260 265 270
Tyr Gln Lys Ile Val Asp Trp Ala Gln Glu Asn Ala Pro Ala Lys Ala
275 280 285
Gly Arg Lys Phe Ala Glu Asp Phe Glu Ala Tyr Cys Asp Lys Lys Arg
290 295 300
Ser Lys Gly Lys Gln Lys Trp Glu Gly Val Ser Ala Ala Gly Ala Thr

305 310 315 320
Gln Ala Gly Ala Val Gly Gln Lys Lys Lys Lys Lys Lys Lys Lys Arg
325 330 335
Gly Phe Gly Asn Gln Leu Asp Asp Ile Val Val Lys Gly Arg Ala Gly
340 345 350
Arg Leu Gln Tyr Cys Arg Glu His Thr Glu Gln Tyr Ile Gln Tyr Phe
355 360 365
Leu Glu Gly Lys Pro Ile Pro Asn Arg Glu Asp Val Leu Asp Arg Asp

370 375 380
Ile Arg Ser Arg Arg Gln Lys Ile Val Phe Asp Arg Leu Trp Ala Leu
385 390 395 400
Ile Arg Gly Arg Leu Leu Pro Leu Ala Gly Gly Arg Ile Asp Arg Ile
405 410 415
Val Val Glu Arg Val Ala Phe Asp Val Leu Ala Gly Thr Phe Ala Asp
420 425 430
Cys Gln Glu Leu Phe Arg Thr Asp Glu Glu Lys Ala Ala Glu Met Tyr

435 440 445

Trp Phe Gly Pro Arg His Gly Phe Lys Asn Glu Leu Glu Met Leu Arg

450 455 460

Thr Glu Phe Ala Gly Arg Cys Ala Tyr Cys Gly Gln Gln Phe Gln Asp

465 470 475 480

Leu Glu Val Glu His Ile Leu Pro Arg Ser Arg Phe Pro Phe Asp Ser

485 490 495

Tyr Leu Val Lys Val Pro Ala Cys Arg Gln Cys Asn Met Lys Lys Gly

500 505 510

Gly Arg Ser Ile Leu Glu Ala Gln Met Arg Ile His Pro Asp Ala Tyr

515 520 525

Asp Ala Tyr Glu Gln Tyr Leu Glu Lys Arg Glu Val Arg His Tyr Phe

530 535 540

Cys Asp Ile Lys Lys Gly Val Leu Lys Leu Leu Thr Asn Gly Ala Gln

545 550 555 560

Asn Trp Gly Phe Glu Arg Leu Leu Gly Met Ile Ala His Asn Ile Phe

565 570 575

Glu Gln Gly Lys Ser Gln Asn Ala Pro Arg Ala Leu Gly Arg Trp Leu

580 585 590

Ala Gly Lys Leu Glu Arg Glu Thr Gly Val Arg Pro Lys Val Val Phe

595 600 605

Leu Ser Gly Arg His Thr Ala Ala Trp Arg Gln Gln Val Leu Pro Asp

610 615 620

Tyr Glu Lys Ala Ala Glu Lys Ala Glu Gly Lys Lys Arg Asn His Ala

625 630 635 640

Val Asp Ala Ile Leu Leu Gly Cys Asp Phe Pro Pro Val Ala Phe Leu

645 650 655

Asp Ser Gln Arg Lys Trp Trp Leu Ser Glu Asp Arg Leu Arg Arg Trp

660 665 670

Glu Glu Gln Val Lys Ala Ala Ala Pro Glu Leu Ala Asp Leu Ala Gly

675 680 685

Asp Gly Asp Ala Ala Pro Ala Arg Leu Pro Arg Val Glu Ala Pro Pro

690 695 700

Pro Ile Arg Phe Phe Glu Glu Asp Leu Gly Gly Gly Tyr Phe Lys Ile

705 710 715 720

Asp Leu Ser Ala Phe Gly Trp Asn Arg Arg Arg Gln Ser Gly Ala Lys

725 730 735

Val Asp Pro Val Arg Met Ile Thr Thr Ala Asn Gly Lys Leu Val Ala

740 745 750

Lys Arg Glu Pro Ala Gln Ala Val Leu Lys Asp Leu Leu Ala Glu Lys

755 760 765

Gln Arg Asp Lys Arg Ile Lys Leu Ile Ala Asn Arg Arg Leu Arg Gln

770 775 780

Leu Leu Gln Ser Asp Pro Ala Asn Ala Ala Arg Asn Tyr Val Leu Trp

785 790 795 800

Leu Gln Arg Gln Thr Ala Arg Gly Leu Arg Ala Ala Lys Met Gly Asn

805 810 815

His Pro Ala Asp Thr Lys Arg Arg Glu Met Leu Glu Gln Phe Ile Asn

820 825 830

Thr Pro Val Asp Asp Phe Leu Arg Pro Ser Lys Arg Arg Thr Ala Lys

835 840 845

Lys Ala Gln Gln Gln Thr Gln Ser Ser Asp Gly Arg Gly Asn Gly Gln

850 855 860

Ser Ala Ala Glu Gln Thr Ser Ala Ala Glu Ile Pro Ala Ile Ile Gly

865 870 875 880

Val Cys Cys Leu Ile Glu Gln Lys Tyr Thr Lys Tyr Asp Val Pro Arg

885 890 895

Cys Asp Arg Asn Gly Lys Pro Leu His Tyr Tyr Ala Ser Gln Pro Ala

900 905 910

Ile Arg Ala Leu Tyr Val Gly Tyr Lys Arg Arg Lys Asp Gly Arg Leu

915 920 925

Asp Arg Ser Lys Pro Glu Ile Phe Arg Val Asn Gln Val Trp Lys Val

930 935 940

Tyr Tyr Gly Pro Pro Gly Gln Asp Gln Asp Ser Pro Lys Ala Arg Lys

945 950 955 960

Val Ile Glu Lys Leu Gly Gln Asp Ser Pro Leu His Gly Arg Met Leu

965 970 975

Gly Gln Arg Gly Ser Trp Gln Glu Phe Arg Lys Arg Trp His Glu Ala

980 985 990

Phe Ala Arg Leu Trp Ala Asp Leu Gly Val Glu Lys Arg Phe Gln Ile

995 1000 1005

Ala Gln Gly Ala Val Ile Glu Lys Thr Asp Gly Thr Cys Phe Leu

1010 1015 1020

Val Arg Asn Phe Asp Asn Thr Glu Gly Trp Met Arg Gly Ser Pro

1025 1030 1035

Trp Lys Asp Ile Arg Arg Val Tyr Arg Ser Pro Leu His Tyr Leu

1040 1045 1050

Ser Ala Lys Ala Lys Ala Ala Phe Asp His Ser Ser Arg Ser Ala

1055 1060 1065

Ala Thr Val Ala Glu Thr Ile Asn

1070 1075

<210> 587

<211> 937

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG102 effectors

<220><223> Description: MG102-7 effector

<400> 587

Met Ser Val Thr Leu Thr Ile Asp Pro Gly Ser Arg Asn Ile Gly Leu

1 5 10 15

Ala Leu Val Arg Ser Arg Ala Gly Asp Arg Pro Ser Ala Leu Tyr Ala

20 25 30

Ala Cys Ile Val Ala Glu Pro Lys Pro Leu Lys Glu Leu Val Val Arg

35 40 45

Arg Ala Gln Leu Arg Arg Met Arg Arg Thr Arg Lys Thr Arg Arg Arg

50 55 60

Arg Leu Arg Arg Leu Ala Asp Ala Leu Arg Gly Ile Ala Gly Ala Glu

65 70 75 80

Ala Ile Val Arg Phe Cys Arg Arg Arg Gly Tyr Ser His Asp Pro Lys

85 90 95

Arg Ala Arg Asp Gly Arg Gly Ala Asp Asp Ser Thr Gly Ala Asp Lys

100 105 110

Leu Leu Phe Asn Val Ser Arg Glu Asp Phe Phe Lys Ala Leu Glu Ala

115 120 125

Glu Val Gln Arg Val Ile Ala Glu Pro Asp Arg Gln Arg Val Leu Ala

130 135 140

Ala Cys Arg Arg His Leu Asn Ala Ala Arg Leu Pro Gly Arg Glu Leu

145 150 155 160

Arg Pro Pro Arg Phe Asp Asn Arg Ala Val Gly Arg Cys Arg Trp Gln

165 170 175

Asp Cys Pro Arg Arg Pro Arg Arg Arg Ala Asn Ala Val Glu Glu Asn

180 185 190

Leu Arg Gln Thr Leu Tyr Glu Trp Leu Lys Pro Val Phe Gly Glu Ala

195 200 205

Leu Ala Gly Leu Glu Gln Ala Glu Ala Ala Lys Ala Lys Ser Gln Met

210 215 220

Cys Ala Glu Leu Asp His Trp Cys Ser Leu Leu Ala Lys Leu Ala Ala

225 230 235 240

Glu Tyr Arg Lys Leu Ala Asp Glu Gln Pro Asp Gln Arg Asp Glu Lys

245 250 255

Ala Ile Lys Lys Val Ser Ala Leu Leu Glu Arg Arg Lys Asn Glu Leu

260 265 270

Tyr Gln Lys Ile Val Asp Trp Ala Gln Glu Asn Ala Pro Ala Lys Ala

275 280 285

Gly Arg Lys Phe Ala Glu Asp Phe Glu Ala Tyr Cys Asp Lys Lys Arg

290 295 300

Ser Lys Gly Lys Gln Lys Trp Glu Gly Val Ser Ala Ala Gly Ala Thr

305 310 315 320

Gln Ala Gly Ala Val Gly Gln Lys Lys Lys Lys Lys Lys Lys Lys Arg

325 330 335

Gly Phe Gly Asn Gln Leu Asp Asp Ile Val Val Lys Gly Arg Ala Gly

340 345 350

Arg Leu Gln Tyr Cys Arg Glu His Thr Glu Gln Tyr Ile Gln Tyr Phe

355 360 365

Leu Glu Gly Lys Pro Ile Pro Asn Arg Glu Asp Val Leu Asp Arg Asp

370 375 380

Ile Arg Ser Arg Arg Gln Lys Ile Val Phe Asp Arg Leu Trp Ala Leu

385 390 395 400

Ile Arg Gly Arg Leu Leu Pro Leu Ala Gly Gly Arg Ile Asp Arg Ile

405 410 415

Val Val Glu Arg Val Ala Phe Asp Val Leu Ala Gly Thr Phe Ala Asp

420 425 430

Cys Gln Glu Leu Phe Arg Thr Asp Glu Glu Lys Ala Ala Glu Met Tyr

435 440 445

Trp Phe Gly Pro Arg His Gly Phe Lys Asn Glu Leu Glu Met Leu Arg

450 455 460

Thr Glu Phe Ala Gly Arg Cys Ala Tyr Cys Gly Gln Gln Phe Gln Asp

465 470 475 480

Leu Glu Val Glu His Ile Leu Pro Arg Ser Arg Phe Pro Phe Asp Ser

485 490 495

Tyr Leu Val Lys Val Pro Ala Cys Arg Gln Cys Asn Met Lys Lys Gly

500 505 510

Gly Arg Ser Ile Leu Glu Ala Gln Met Arg Ile His Pro Asp Ala Tyr

515 520 525

Asp Ala Tyr Glu Gln Tyr Leu Glu Lys Arg Glu Val Arg His Tyr Phe
530 535 540
Cys Asp Ile Lys Lys Gly Val Leu Lys Leu Leu Thr Asn Gly Ala Gln

545 550 555 560
Asn Trp Gly Phe Glu Arg Leu Leu Gly Met Ile Ala His Asn Ile Phe
565 570 575
Glu Gln Gly Lys Ser Gln Asn Ala Pro Arg Ala Leu Gly Arg Trp Leu
580 585 590
Ala Gly Lys Leu Glu Arg Glu Thr Gly Val Arg Pro Lys Val Val Phe
595 600 605
Leu Ser Gly Arg His Thr Ala Ala Trp Arg Gln Gln Val Leu Pro Asp

610 615 620
Tyr Glu Lys Ala Ala Glu Lys Ala Glu Gly Lys Lys Arg Asn His Ala
625 630 635 640
Val Asp Ala Ile Leu Leu Gly Cys Asp Phe Pro Pro Val Ala Phe Leu
645 650 655
Asp Ser Gln Arg Lys Trp Trp Leu Ser Glu Asp Arg Leu Arg Arg Trp
660 665 670
Glu Glu Gln Val Lys Ala Ala Ala Pro Glu Leu Ala Asp Leu Ala Gly

675 680 685
Asp Gly Asp Ala Ala Pro Ala Arg Leu Pro Arg Val Glu Ala Pro Pro
690 695 700
Pro Ile Arg Phe Phe Glu Glu Asp Leu Gly Gly Gly Tyr Phe Lys Ile
705 710 715 720
Asp Leu Ser Ala Phe Gly Trp Asn Arg Arg Arg Gln Ser Gly Ala Lys
725 730 735
Val Asp Pro Val Arg Met Ile Thr Thr Ala Asn Gly Lys Leu Val Ala

740 745 750
Lys Arg Glu Pro Ala Gln Ala Val Leu Lys Tyr Leu Leu Ala Glu Lys
755 760 765
Gln Arg Asp Lys Arg Ile Lys Leu Ile Ala Asn Arg Arg Leu Arg Gln

770 775 780

Leu Leu Gln Ser Asp Pro Ala Asn Ala Ala Arg Asn Tyr Val Leu Trp

785 790 795 800

Leu Gln Arg Gln Thr Ala Arg Gly Leu Arg Ala Ala Lys Met Gly Asn

805 810 815

His Pro Ala Asp Thr Lys Arg Arg Glu Met Leu Glu Gln Phe Ile Asn

820 825 830

Thr Pro Val Asp Asp Phe Leu Arg Ser Gly Lys Arg Arg Thr Ala Lys

835 840 845

Lys Ala Gln Gln Gln Thr Gln Ser Ser Asp Gly Arg Gly Ser Gly Gln

850 855 860

Ser Ala Ala Glu Gln Thr Ser Ala Ala Glu Ile Pro Ala Ile Ile Gly

865 870 875 880

Val Cys Cys Leu Ile Ala Gln Lys Tyr Thr Lys Tyr Asp Val Pro Arg

885 890 895

Cys Asp Arg Asn Gly Lys Pro Leu His Tyr Tyr Ala Ser Gln Pro Ala

900 905 910

Ile Arg Ala Leu Tyr Val Gly Tyr Lys Arg Arg Lys Asp Gly Arg Leu

915 920 925

Asp Arg Ser Lys Pro Glu Ile Phe Arg

930 935

<210> 588

<211> 782

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG102 effectors

<220><223> Description: MG102-8 effector

<400> 588

Leu Gln Ala Ile Ile Ile Asp Thr Glu Gln Tyr His Arg Ala Leu Ser

1 5 10 15

Val Cys Glu Arg Val Leu Asn Arg Arg Gly Gly Arg Tyr Gly Glu Ile
20 25 30
Arg Pro Leu Lys Ile Asp Asn Arg Gly Arg Ser Arg Cys Ala Trp Glu

35 40 45
Gly Cys Asn Arg Val Thr Pro Arg Arg His Asn Ala Thr Asp Asp Val
50 55 60
Val Arg Gln Gln Leu Val Thr Tyr Phe Gln Ser Pro Leu Arg Arg Glu
65 70 75 80
Pro Gly Lys Leu Pro Met Leu Glu Gln Ala Val Val Lys Leu Asp Ile
85 90 95
Ile Ser Lys Asn Leu Arg Gly Ser Asn Glu Ala Lys Cys Arg Asn Ala

100 105 110
Leu Asp Lys Arg Ala Arg Thr Ile Leu Arg Gly Leu Gln Ala Ala Leu
115 120 125
Pro Met His Glu Asp Glu Gly Gly Ser Asp Lys Glu Ser Trp Glu Tyr
130 135 140
Val Glu Lys Gly Ile Val Lys Ile Leu Glu Asn Ala Gly Gly Arg Asn
145 150 155 160
Arg Tyr Cys Arg Glu His Ser Lys Ala Tyr Cys Asp Arg Val Leu Glu

165 170 175
Gly Lys Pro Ser Glu Phe Lys Ser Ser Ile Gln Glu Ser Asp Ile Ile
180 185 190
Ser Arg Arg Glu Gln Ile Ile Phe Asn Lys Leu Trp Arg Tyr Ile Glu
195 200 205
Ala Arg Leu Leu Pro Leu Ala Pro Glu Gly Ile Asp Arg Ile Val Val
210 215 220
Glu Arg Thr Ala Phe Asp Leu Leu Ala Gly Lys Gln Lys Lys Ile Arg

225 230 235 240
Asp Ala Ser Ser Lys Ser Val Glu Ser Ile Tyr Gln Tyr Gly Pro Arg
245 250 255
Tyr Gly Phe Thr Ser Glu Lys Glu Met Leu Arg Lys Glu Phe Gly Gly

260 265 270

Leu Cys Ala Tyr Cys Gly Lys Pro Ser Glu Thr Leu Leu Glu Arg Glu

275 280 285

His Ile Leu Pro Arg Arg Leu Phe Phe Phe Asp Ser Tyr Leu Asn Ile

290 295 300

Leu Pro Ser Cys Pro Gln Cys Asn Ala Ala Lys Gly Thr Ser Leu Pro

305 310 315 320

Gly Val Ser Ser Leu Arg Ile His Glu Asp Ala Tyr Arg Asn Tyr Glu

325 330 335

Ser Tyr Ile Asn Glu Leu Lys Ser Lys Arg Pro Leu His Phe Leu His

340 345 350

Thr Glu Lys Lys Gly Ile Leu Asn Leu Met Arg Asp Pro Glu Arg Ala

355 360 365

Trp Asp Trp Glu Arg Tyr Leu Arg Leu Ile Ala Asn Asn Phe Ala Ser

370 375 380

Ile Val Gln Thr Gln Arg Gly Pro Arg Pro Phe Ala Arg Tyr Leu Tyr

385 390 395 400

Ser Lys Leu Ser Arg Arg Gln Glu Lys Pro Pro Glu Ile Ala Phe Arg

405 410 415

Ser Gly Arg His Thr Ala Leu Tyr Arg Ser Val Ala Tyr Pro Asp Phe

420 425 430

Ser Lys Ala Gln Glu Lys Ala Gly Glu Asp Gly Asn Ser His Pro Val

435 440 445

Asn His Ala Leu Asp Ala Leu Leu Leu Ala Ser Lys Leu Pro Arg Pro

450 455 460

Glu Pro Leu Glu Ala Arg Gly Leu Asn His Ala Ser Leu Lys Ala Trp

465 470 475 480

Ala Asp Gln Val Arg Gly Lys Ala Ala Pro Ala Gly Glu Asp Gly Ile

485 490 495

Pro Val Ile Pro Ala Tyr Lys Cys Phe Val Pro Gly Phe Glu Glu Thr

500 505 510

Asp Ala His Gly Tyr Val Thr Val Glu Met Ala Met Met Asn Trp Asn
515 520 525
Lys Lys Asp Thr Ala Thr Thr Lys Gln Asp Pro Tyr Gly Trp Ser Glu
530 535 540
Ser Arg Gln His Pro Thr Lys Arg Val Ser Ala Arg Thr Leu Phe Asp

545 550 555 560
Asp Leu Arg Glu Glu Lys Ser Lys Lys Asn Pro Ser Glu Leu Ile Lys
565 570 575
Arg Ile Tyr His Pro Ala Leu Arg Ser Ala Val Glu Lys Ala Tyr Gln
580 585 590
Glu Ser His Asn Arg Ile Gln Ala Ala Glu Ala Leu Lys Asn Trp Leu
595 600 605
Arg Asp Ser Val Lys Asn Ser Leu Arg Ser Ser Ser Phe Ser Arg His

610 615 620
Pro Ser Asp Ile Arg Arg Arg Gln Asp Leu Glu Arg Leu Ala Asn Gly
625 630 635 640
Lys Thr Asp Glu Ile Pro Val Val Ile Gly Ile Lys Cys Leu Asp Thr
645 650 655
Gly Val Ala Gly Lys Ile Asp Ala Ala Arg Met Asp Arg Gln Thr Gly
660 665 670
Thr Thr Gly His Arg Tyr Leu Thr Asp Pro Ala Asn Arg Gly Val Val

675 680 685
Leu Ala Tyr Pro Thr Thr Arg Ser Gly Ala Cys Asp Arg Arg Lys Pro
690 695 700
Cys Thr Ala Gly Ile Arg Gln Asn Tyr Ser Leu Lys Thr Asp Glu Thr
705 710 715 720
Ala Phe Arg Ser Met Pro Ala Ser Leu Glu Arg Gly Val Val Trp Gly
725 730 735
Lys Lys Thr His Ser Pro Arg Ala Met Glu Ser Ala Phe Ser Lys Glu

740 745 750
Leu Glu Gln Tyr Leu Arg Asp Arg Arg Phe His Ser Tyr Cys Ile Leu

755 760 765

Thr Ala Gly Cys Val Val Cys Tyr Glu Asp Gly Thr Glu Arg

770 775 780

<210> 589

<211> 1076

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG102 effectors

<220><223> Description: MG102-9 effector

<400> 589

Met Ser Val Thr Leu Thr Ile Asp Pro Gly Ser Arg Asn Ile Gly Leu

1 5 10 15

Ala Leu Val Arg Ser Arg Ala Gly Asp Arg Pro Ser Ala Leu Tyr Ala

20 25 30

Ala Cys Ile Val Ala Glu Pro Lys Pro Leu Lys Glu Leu Val Val Arg

35 40 45

Arg Ala Gln Leu Arg Arg Met Arg Arg Thr Arg Lys Thr Arg Arg Arg

50 55 60

Arg Leu Arg Arg Leu Ala Asp Ala Leu Arg Gly Ile Ala Gly Ala Glu

65 70 75 80

Ala Ile Val Arg Phe Cys Arg Arg Arg Gly Tyr Ser His Asp Pro Lys

85 90 95

Arg Ala Arg Asp Gly Arg Gly Ala Asp Asp Ser Thr Gly Ala Asp Lys

100 105 110

Leu Leu Phe Asn Val Ser Arg Glu Asp Phe Phe Lys Ala Leu Glu Ala

115 120 125

Glu Val Gln Arg Val Ile Ala Glu Pro Asp Arg Gln Arg Val Leu Ala

130 135 140

Ala Cys Arg Arg His Leu Asn Ala Ala Arg Leu Pro Gly Arg Glu Leu

145 150 155 160

Arg Pro Pro Arg Phe Asp Asn Arg Ala Val Gly Arg Cys Gly Trp Gln
165 170 175
Asp Cys Pro Arg Arg Pro Pro Arg Arg Ala Asn Ala Val Glu Glu Asn
180 185 190

Leu Arg Gln Thr Leu Tyr Glu Trp Leu Lys Pro Val Phe Gly Glu Ala
195 200 205
Leu Ala Gly Leu Glu Gln Ala Glu Ala Ala Lys Ala Lys Ser Lys Met
210 215 220
Cys Ala Glu Leu Asp His Trp Cys Ser Leu Leu Ala Lys Leu Ala Ala
225 230 235 240
Glu Tyr Arg Lys Leu Ala Asp Glu Gln Pro Asp Gln Arg Asp Glu Lys
245 250 255

Ala Ile Lys Lys Val Ser Ala Leu Leu Glu Arg Arg Lys Asn Glu Leu
260 265 270
Tyr Gln Lys Ile Val Asp Trp Ala Gln Glu Asn Ala Pro Ala Lys Ala
275 280 285
Gly Arg Lys Phe Ala Glu Asp Phe Glu Ala Tyr Cys Asp Lys Lys Arg
290 295 300
Ser Lys Gly Lys Gln Lys Trp Glu Gly Val Ser Ala Ala Gly Ala Thr
305 310 315 320

Gln Ala Gly Ala Val Gly Gln Lys Lys Lys Lys Lys Lys Lys Lys Arg
325 330 335
Gly Phe Gly Asn Gln Leu Asp Asp Ile Val Val Lys Gly Arg Ala Gly
340 345 350
Arg Leu Gln Tyr Cys Arg Glu His Thr Glu Gln Tyr Ile Gln Tyr Phe
355 360 365
Leu Glu Gly Lys Pro Ile Pro Asn Arg Glu Asp Val Leu Asp Arg Asp
370 375 380

Ile Arg Ser Arg Arg Gln Lys Ile Val Phe Asp Arg Leu Trp Ala Leu
385 390 395 400
Ile Arg Gly Arg Leu Leu Pro Leu Ala Gly Gly Arg Ile Asp Arg Ile

405 410 415

Val Val Glu Arg Val Ala Phe Asp Val Leu Ala Gly Thr Phe Ala Asp

420 425 430

Cys Gln Glu Leu Phe Arg Thr Asp Glu Glu Lys Ala Ala Glu Met Tyr

435 440 445

Trp Phe Gly Pro Arg His Gly Phe Lys Asn Glu Leu Glu Met Leu Arg

450 455 460

Thr Glu Phe Ala Gly Arg Cys Ala Tyr Cys Gly Gln Gln Phe Gln Asp

465 470 475 480

Leu Glu Val Glu His Ile Leu Pro Arg Ser Arg Phe Pro Phe Asp Ser

485 490 495

Tyr Leu Val Lys Val Pro Ala Cys Arg Gln Cys Asn Met Lys Lys Gly

500 505 510

Gly Arg Ser Ile Leu Glu Ala Gln Met Arg Ile His Pro Asp Ala Tyr

515 520 525

Asp Ala Tyr Glu Gln Tyr Leu Glu Lys Arg Glu Val Arg His Tyr Phe

530 535 540

Cys Asp Ile Lys Lys Gly Val Leu Lys Leu Leu Thr Asn Gly Ala Gln

545 550 555 560

Asn Trp Gly Phe Glu Arg Leu Leu Gly Met Ile Ala His Asn Ile Phe

565 570 575

Glu Gln Gly Lys Ser Gln Asn Ala Pro Arg Ala Leu Gly Arg Trp Leu

580 585 590

Ala Gly Lys Leu Glu Arg Glu Thr Gly Val Arg Pro Glu Val Val Phe

595 600 605

Leu Ser Gly Arg His Thr Ala Ala Trp Arg Gln Gln Val Leu Pro Asp

610 615 620

Tyr Glu Lys Ala Ala Glu Lys Ala Glu Gly Lys Lys Arg Asn His Ala

625 630 635 640

Val Asp Ala Ile Leu Leu Gly Cys Asp Phe Pro Pro Val Ala Phe Leu

645 650 655

Asp Ser Gln Arg Lys Trp Trp Leu Ser Glu Asp Arg Leu Arg Arg Trp
660 665 670
Glu Glu Gln Val Lys Ala Ala Ala Pro Glu Leu Ala Asp Leu Ala Gly
675 680 685
Asp Gly Asp Ala Ala Pro Ala Arg Leu Pro Arg Val Glu Ala Pro Pro
690 695 700

Pro Ile Arg Phe Phe Glu Glu Asp Leu Gly Gly Gly Tyr Phe Lys Ile
705 710 715 720
Asp Leu Ser Ala Phe Gly Trp Asn Arg Arg Arg Gln Ser Gly Ala Lys
725 730 735
Val Asp Pro Val Arg Met Ile Thr Thr Ala Asn Gly Lys Leu Val Ala
740 745 750
Lys Arg Glu Pro Ala Gln Thr Val Leu Lys Tyr Leu Leu Asp Glu Glu
755 760 765

Gln Arg Asp Lys Arg Ile Gly Leu Ile Ala Asn Arg Arg Leu Arg Gln
770 775 780
Leu Leu Gln Ser Asp Pro Ala Asn Ala Ala Arg Asn Tyr Val Leu Trp
785 790 795 800
Leu Gln Arg Gln Thr Ala Arg Gly Leu Arg Ala Ala Lys Met Gly Asn
805 810 815
His Pro Ala Asp Thr Lys Arg Arg Glu Met Leu Glu Gln Phe Ile Asn
820 825 830

Thr Pro Val Asp Asp Phe Leu Arg Ser Gly Lys Arg Arg Thr Ala Lys
835 840 845
Lys Ala Gln Gln Gln Thr Gln Ser Ser Asp Gly Arg Gly Asn Gly Gln
850 855 860
Ser Ala Ala Glu Gln Thr Ser Ala Ala Glu Ile Pro Ala Ile Ile Gly
865 870 875 880
Val Cys Cys Leu Ile Glu Gln Lys Tyr Thr Lys Tyr Asp Val Pro Arg
885 890 895

Cys Asp Arg Asn Gly Lys Pro Leu His Tyr Tyr Ala Ser Gln Pro Ala

900 905 910

Ile Arg Ala Leu Tyr Val Gly Tyr Lys Arg Arg Lys Asp Gly Arg Leu

915 920 925

Asp Arg Ser Lys Pro Glu Ile Phe Arg Val Asn Gln Val Trp Lys Val

930 935 940

Tyr Tyr Gly Pro Pro Gly Lys Asp Gln Asp Ser Pro Lys Ala Arg Lys

945 950 955 960

Val Ile Glu Lys Leu Gly Gln Asp Ser Pro Leu His Gly Arg Met Leu

965 970 975

Gly Gln Arg Gly Ser Trp Gln Glu Phe Arg Lys Arg Trp His Glu Ala

980 985 990

Phe Ala Arg Leu Trp Ala Asp Leu Gly Val Glu Lys Arg Phe Gln Ile

995 1000 1005

Ala Gln Gly Ala Val Ile Glu Lys Thr Asp Gly Thr Cys Phe Leu

1010 1015 1020

Val Arg Asn Phe Asp Asn Thr Glu Gly Trp Met Arg Gly Ser Pro

1025 1030 1035

Trp Lys Asp Ile Arg Arg Val Tyr Arg Ser Pro Leu His Tyr Leu

1040 1045 1050

Ser Ala Lys Ala Lys Ala Ala Phe Asp His Ser Ser Arg Ser Ala

1055 1060 1065

Ala Thr Val Ala Glu Thr Ile Asn

1070 1075

<210> 590

<211> 1058

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG102 effectors

<220><223> Description: MG102-10 effector

<400> 590

Met Cys Val Thr Leu Thr Thr Asp Tyr Gly Ser Arg Asn Ile Gly Leu
1 5 10 15
Ala Leu Met Gln Ala His Ala Gly Gln Arg Pro Thr Ala Leu Tyr Ala
20 25 30
Ala Thr Ile Ile Val Glu Pro Lys Pro Leu Lys Glu Leu Val Val Arg
35 40 45

Arg Ala Gln Leu Arg Arg Met Arg Arg Thr Arg Lys Thr Arg Arg Arg
50 55 60
Arg Leu Arg Arg Leu Ala Asp Ala Leu Arg Gly Ile Ala Gly Ala Glu
65 70 75 80
Thr Ile Val Arg Phe Cys Arg Arg Arg Gly Tyr Ser His Asp Pro Lys
85 90 95
Arg Glu Arg Glu Gly Arg Gly Ser Asp Asp Ser Asn Ser Ser Glu Lys
100 105 110

Val Leu Phe Ala Val Ser Arg Glu Glu Phe Phe Lys Ala Leu Glu Ala
115 120 125
Glu Val Gln Arg Val Ile Ala Glu Pro Asp Arg Gln Arg Val Leu Ala
130 135 140
Ala Cys Arg Arg His Leu Asn Ala Ala Arg Leu Pro Gly Ala Glu Leu
145 150 155 160
Arg Pro Pro Arg Phe Asp Asn Arg Ala Val Gly Arg Cys Gly Trp Gln
165 170 175

Gly Cys Ser Arg Arg Pro Pro Arg Ala Glu Asn Ala Val Trp Glu Cys
180 185 190
Leu Arg Gln Thr Leu Tyr Gly Trp Leu Lys Pro Val Phe Asp Glu Ala
195 200 205
Leu Ala Asn Leu Glu Gln Ala Glu Ala Ala Lys Ala Arg Ala Ala Met
210 215 220
Cys Ala Glu Val Asp Gln Trp Cys Ser Ala Leu Val Lys Leu Ala Ala
225 230 235 240

Glu Tyr Arg Lys Leu Ala Asp Gln Gln Pro Ala Gln Arg Asp Lys Lys

245 250 255

Asp Val Asp Lys Thr Ile Ala Leu Leu Thr Arg Arg Lys Lys Gln Leu

260 265 270

Tyr Arg Gln Ile Val Arg Trp Val Gln Asp Thr Ala Pro Ala Lys Ala

275 280 285

Gly Arg Lys Phe Ala Ala Asp Phe Glu Ala Tyr Val Gly Lys Lys Gly

290 295 300

Gly Lys Gly Lys Gln Lys Ser Gly Ser Val Ser Ala Ala Gly Ala Arg

305 310 315 320

Gln Ala Gly Val Arg Gln Lys Lys Thr Lys Arg Gly Phe Arg Asn Gln

325 330 335

Leu Asp Asp Ile Val Val Lys Gly Arg Ser Gly Arg Leu Arg Tyr Cys

340 345 350

Arg Glu His Ser Ala Gln Tyr Ile Gln Tyr Leu Leu Asp Gly Lys Gln

355 360 365

Ile Pro Asn Arg Glu Asp Val Leu Asp Arg Asp Ile Arg Ser Arg Arg

370 375 380

Gln Lys Ile Val Phe Asp Arg Leu Trp Thr Leu Ile Arg Gly Arg Leu

385 390 395 400

Leu Pro Leu Ala Gly Gly Arg Ile Asp Arg Ile Val Val Glu Arg Val

405 410 415

Ala Phe Asp Val Leu Ala Gly Arg Phe Lys His Arg Gln Lys Phe Tyr

420 425 430

Ser Gly Lys Glu Glu Arg Ala Ala Glu Met Tyr Trp Phe Gly Pro Gly

435 440 445

Tyr Gly Phe Asp Ser Glu Leu Glu Met Leu Arg Glu Glu Phe Gly Gly

450 455 460

Arg Cys Ala Tyr Cys Gly Gln Gln Ser Gln Asp Met Glu Val Glu His

465 470 475 480

Ile Leu Pro Arg Ser Arg Phe Pro Phe Asp Ser Tyr Leu Leu Lys Val

485 490 495

Pro Ala Cys Arg Gln Cys Asn Met Arg Lys Gly Ala Arg Ser Ile Thr
500 505 510

Glu Ala Lys Met Arg Ile His Pro Asp Ala Tyr Gly Ala Tyr Glu Arg
515 520 525

Tyr Leu Glu Lys Arg Asn Val Arg His Tyr Phe Cys Asp Ile Lys Lys
530 535 540

Gly Ala Leu Lys Leu Leu Thr Asn Gly Thr Gln Asn Trp Asp Ala Glu
545 550 555 560

Arg Leu Leu Gly Met Ile Ala Gln Asn Ile Leu Glu Met Gly Lys Ser
565 570 575

Gln Asn Ala Ser Arg Ala Leu Ala Arg Trp Leu Ala Gly Lys Leu Glu
580 585 590

Arg Glu Thr Gly Val Arg Pro Glu Val Val Phe Arg Asn Gly Arg Tyr
595 600 605

Thr Ala Ala Cys Arg Glu Val Val Leu Pro Glu Tyr Asp Lys Pro Ala
610 615 620

Glu Lys Arg Lys Gly Asn Thr Arg Asn His Ala Val Asp Ala Ile Leu
625 630 635 640

Leu Gly Cys Asp Phe Pro Ala Val Thr Phe Val Asp Ala Gln Gly Lys
645 650 655

Trp Trp Leu Ser Glu Asp Arg Leu Arg His Trp Glu Glu Gln Val Lys
660 665 670

Ala Ala Ala Pro Glu Leu Val Glu Leu Pro Gly Gln Gly Asp Ala Pro
675 680 685

Pro Ala Lys Leu Pro Arg Val Glu Ala Pro Ala Pro Ile Arg Phe Phe
690 695 700

Glu Glu Asp Val Gly Gly Gly Tyr Phe Lys Ile Asp Leu Ser Ala Phe
705 710 715 720

Gly Trp Asn Arg Arg Arg Gln Ser Gly Thr Lys Val Asp Pro Val Arg
725 730 735

Lys Ile Thr Thr Ala Asn Gly Thr Arg Leu Ala Lys Arg Glu Pro Ala

740 745 750

Gln Ala Val Leu Asp Lys Leu Leu Ala Lys Glu Lys Asp Arg Asp Lys
755 760 765

Cys Ile Ala Leu Ile Ala Asn Arg Arg Leu Arg Gln Leu Leu Gln Ser
770 775 780

Asp Pro Asp Ser Ala Ala Arg Asn Tyr Val Leu Trp Leu Gln Arg Gln
785 790 795 800

Thr Ala Arg Gly Leu Arg Ala Ala Lys Met Gly Asn His Pro Ala Asp
805 810 815

Ile Lys Arg Arg Gln Met Leu Gln Gln Phe Ile Asn Thr Pro Val Asp
820 825 830

Ala Phe Leu Arg Pro Gly Lys Glu Arg Ser Ala Gln Asp Ala Pro Gln
835 840 845

Gln Ala Gln Ser Asp Tyr Ala Gln Ile Pro Glu Val Ile Gly Val Cys
850 855 860

Cys Leu Ile Asp Gln Gly Glu Ile Lys Tyr Asp Val Pro Arg Cys Asp
865 870 875 880

Arg Val Gly Lys Pro Ile His Tyr Tyr Ala Ser Gln Pro Ala Ile Arg
885 890 895

Ala Leu Tyr Val Gly Tyr Lys Arg Arg Lys Asp Gly Lys Leu Asp Arg
900 905 910

Ser Lys Pro Val Ile Phe Arg Val Asn Gln Val Trp Lys Val Tyr Tyr
915 920 925

Gly Pro Pro Gly Lys Asp Gln Asp Ser Pro Ala Ala Arg Glu Val Ile
930 935 940

Glu Lys Leu Gly Gln Asp Ser Pro Leu His Gly Arg Met Leu Gly Gln
945 950 955 960

Arg Gly Ser Trp Gln Lys Phe Arg Arg Arg Trp His Glu Ala Phe Asp
965 970 975

Arg Leu Trp Ala Asp Leu Gly Val Glu Lys Arg Phe Arg Ile Ala Gln
980 985 990

Gly Ala Val Ile Glu Lys Thr Asp Gly Thr Cys Phe Leu Val Arg Asn
995 1000 1005

Phe Asp Thr Ser Glu Pro Trp Met Lys Gly Ser Pro Trp Lys Asn
1010 1015 1020
Ile Arg Arg Val Tyr Arg Ser Pro Leu His Tyr Leu Ala Ala Lys
1025 1030 1035
Ala Lys Ala Ala Ser His Asn Ser Ala Gln Thr Gly Ala Pro Val
1040 1045 1050
Ala Glu Thr Leu Ser
1055
<210> 591
<211> 1076
<212> PRT
<213> Unknown
<220><223> Description of Unknown:

uncultivated organism
<220><223> Category: MG102 effectors
<220><223> Description: MG102-11 effector
<400> 591
Met Ser Val Thr Leu Thr Ile Asp Pro Gly Ser Arg Asn Ile Gly Leu
1 5 10 15
Ala Leu Val Arg Ser Arg Ala Gly Asp Arg Pro Ser Ala Leu Tyr Ala
20 25 30
Ala Cys Ile Val Ala Glu Pro Lys Pro Leu Lys Glu Leu Val Val Arg
35 40 45

Arg Ala Gln Leu Arg Arg Met Arg Arg Thr Arg Lys Thr Arg Arg Arg
50 55 60
Arg Leu Arg Arg Leu Ala Asp Ala Leu Arg Gly Ile Ala Gly Ala Glu
65 70 75 80
Ala Ile Val Arg Phe Cys Arg Arg Arg Gly Tyr Ser His Asp Pro Lys
85 90 95
Arg Ala Arg Asp Gly Arg Gly Ala Asp Asp Ser Thr Gly Ala Asp Lys

100 105 110

Leu Leu Phe Asn Val Ser Arg Glu Asp Phe Phe Lys Ala Leu Glu Ala
115 120 125
Glu Val Gln Arg Val Ile Ala Glu Pro Asp Arg Gln Arg Val Leu Ala
130 135 140
Ala Cys Arg Arg His Leu Asn Ala Ala Arg Leu Pro Gly Arg Glu Leu
145 150 155 160
Arg Pro Pro Arg Phe Asp Asn Arg Ala Val Gly Arg Cys Arg Trp Gln
165 170 175

Asp Cys Pro Arg Arg Pro Pro Arg Arg Ala Asn Ala Val Glu Glu Asn
180 185 190
Leu Arg Gln Thr Leu Tyr Glu Trp Leu Lys Pro Val Phe Gly Glu Ala
195 200 205
Leu Ala Gly Leu Glu Gln Ala Glu Ala Asp Lys Ala Lys Ser Gln Met
210 215 220
Cys Ala Glu Leu Asp His Trp Cys Ser Leu Leu Ala Lys Leu Ala Ala
225 230 235 240

Glu Tyr Arg Lys Leu Ala Asp Glu Gln Pro Asp Gln Arg Asp Glu Lys
245 250 255
Ala Ile Lys Lys Val Ser Ala Leu Leu Glu Arg Arg Lys Asn Glu Leu
260 265 270
Tyr Gln Lys Ile Val Asp Trp Ala Gln Glu Asn Ala Pro Ala Lys Ala
275 280 285
Gly Arg Lys Phe Ala Glu Asp Phe Glu Ala Tyr Cys Asp Lys Lys Arg
290 295 300

Ser Lys Gly Lys Gln Lys Trp Glu Gly Val Ser Ala Ala Gly Ala Thr
305 310 315 320
Gln Ala Gly Ala Val Gly Gln Lys Lys Lys Lys Lys Lys Lys Lys Arg
325 330 335
Gly Phe Gly Asn Gln Leu Asp Asp Ile Val Val Lys Gly Arg Ala Gly
340 345 350

Arg Leu Gln Tyr Cys Arg Glu His Thr Glu Gln Tyr Ile Gln Tyr Phe
355 360 365

Leu Glu Gly Lys Pro Ile Pro Asn Arg Glu Asp Val Leu Asp Arg Asp
370 375 380
Ile Arg Ser Arg Arg Gln Lys Ile Val Phe Asp Arg Leu Trp Ala Leu
385 390 395 400
Ile Arg Gly Arg Leu Leu Pro Leu Ala Gly Gly Arg Ile Asp Arg Ile
405 410 415
Val Val Glu Arg Val Ala Phe Asp Val Leu Ala Gly Thr Phe Ala Asp
420 425 430

Cys Gln Glu Leu Phe Arg Thr Asp Glu Glu Lys Ala Ala Glu Met Tyr
435 440 445
Trp Phe Gly Pro Arg His Gly Phe Lys Asn Glu Leu Glu Met Leu Arg
450 455 460
Thr Glu Phe Ala Gly Arg Cys Ala Tyr Cys Gly Gln Gln Phe Gln Asp
465 470 475 480
Leu Glu Val Glu His Ile Leu Pro Arg Ser Arg Phe Pro Phe Asp Ser
485 490 495

Tyr Leu Val Lys Val Pro Ala Cys Arg Gln Cys Asn Met Lys Lys Gly
500 505 510
Gly Arg Ser Ile Leu Glu Ala Gln Met Arg Ile His Pro Asp Ala Tyr
515 520 525
Asp Ala Tyr Glu Gln Tyr Leu Glu Lys Arg Glu Val Arg His Tyr Phe
530 535 540
Cys Asp Ile Lys Lys Gly Val Leu Lys Leu Leu Thr Asn Gly Ala Gln
545 550 555 560

Asn Trp Gly Phe Glu Arg Leu Leu Gly Met Ile Ala His Asn Ile Phe
565 570 575
Glu Gln Gly Lys Ser Gln Asn Ala Pro Arg Ala Leu Gly Arg Trp Leu
580 585 590
Ala Gly Lys Leu Glu Arg Glu Thr Gly Val Arg Pro Lys Val Val Phe

595 600 605

Leu Ser Gly Arg His Thr Ala Ala Trp Arg Gln Gln Val Leu Pro Asp

610 615 620

Tyr Glu Lys Ala Ala Glu Lys Ala Glu Gly Lys Lys Arg Asn His Ala

625 630 635 640

Val Asp Ala Ile Leu Leu Gly Cys Asp Phe Pro Pro Val Ala Phe Leu

645 650 655

Asp Ser Gln Arg Lys Trp Trp Leu Ser Glu Asp Arg Leu Arg Arg Trp

660 665 670

Glu Glu Gln Val Lys Ala Ala Ala Pro Glu Leu Ala Asp Leu Ala Gly

675 680 685

Asp Gly Asp Ala Ala Pro Ala Arg Leu Pro Arg Val Glu Ala Pro Pro

690 695 700

Pro Ile Arg Phe Phe Glu Glu Asp Leu Gly Gly Gly Tyr Phe Lys Ile

705 710 715 720

Asp Leu Ser Ala Phe Gly Trp Asn Arg Arg Arg Gln Ser Gly Ala Lys

725 730 735

Val Asp Pro Val Arg Met Ile Thr Thr Ala Asn Gly Lys Leu Val Ala

740 745 750

Lys Arg Glu Pro Ala Gln Ala Val Leu Lys Tyr Leu Leu Ala Glu Lys

755 760 765

Gln Arg Asp Lys Arg Ile Lys Leu Ile Ala Asn Arg Arg Leu Arg Gln

770 775 780

Leu Leu Gln Ser Asp Pro Ala Asn Ala Ala Arg Asn Tyr Val Leu Trp

785 790 795 800

Leu Gln Arg Gln Thr Ala Arg Gly Leu Arg Ala Ala Lys Met Gly Asn

805 810 815

His Pro Ala Asp Thr Lys Arg Arg Glu Met Leu Glu Gln Phe Ile Asn

820 825 830

Thr Pro Val Asp Asp Phe Leu Arg Pro Ser Lys Arg Arg Thr Ala Lys

835 840 845

Lys Ala Gln Gln Gln Thr Gln Ser Ser Asp Gly Arg Gly Asn Gly Gln
850 855 860
Ser Ala Ala Glu Gln Thr Ser Ala Ala Glu Ile Pro Ala Ile Ile Gly
865 870 875 880

Val Cys Cys Leu Ile Glu Gln Lys Tyr Thr Lys Tyr Asp Val Pro Arg
885 890 895
Cys Asp Arg Asn Gly Lys Pro Leu His Tyr Tyr Ala Ser Gln Pro Ala
900 905 910
Ile Arg Ala Leu Tyr Val Gly Tyr Lys Arg Arg Lys Asp Gly Arg Leu
915 920 925
Asp Arg Ser Lys Pro Glu Ile Phe Arg Val Asn Gln Val Trp Lys Val
930 935 940

Tyr Tyr Gly Pro Pro Gly Gln Asp Gln Asp Ser Pro Lys Ala Arg Lys
945 950 955 960
Val Ile Glu Lys Leu Gly Gln Asp Ser Pro Leu His Gly Arg Met Leu
965 970 975
Gly Gln Arg Gly Ser Trp Gln Glu Phe Arg Lys Arg Trp His Glu Ala
980 985 990
Phe Ala Arg Leu Trp Ala Asp Leu Gly Val Glu Lys Arg Phe Gln Ile
995 1000 1005

Ala Gln Gly Ala Val Ile Glu Lys Thr Asp Gly Thr Cys Phe Leu
1010 1015 1020
Val Arg Asn Phe Asp Asn Thr Glu Gly Trp Met Arg Gly Ser Pro
1025 1030 1035
Trp Lys Asp Ile Arg Arg Val Tyr Arg Ser Pro Leu His Tyr Leu
1040 1045 1050
Ser Ala Lys Ala Lys Ala Ala Phe Asp His Ser Ser Arg Ser Ala
1055 1060 1065

Ala Thr Val Ala Glu Thr Ile Asn
1070 1075
<210> 592

<211> 1076

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG102 effectors

<220><223> Description: MG102-12 effector

<400> 592

Met Ser Val Thr Leu Thr Ile Asp Pro Gly Ser Arg Asn Ile Gly Leu
1 5 10 15

Ala Leu Val Arg Ser Arg Ala Gly Asp Arg Pro Ser Ala Leu Tyr Ala
20 25 30

Ala Cys Ile Val Ala Glu Pro Lys Pro Leu Lys Glu Leu Val Val Arg
35 40 45

Arg Ala Gln Leu Arg Arg Met Arg Arg Thr Arg Lys Thr Arg Arg Arg
50 55 60

Arg Leu Arg Arg Leu Ala Asp Ala Leu Arg Gly Ile Ala Gly Ala Glu
65 70 75 80

Ala Ile Val Arg Phe Cys Arg Arg Arg Gly Tyr Ser His Asp Pro Lys
85 90 95

Arg Ala Arg Asp Gly Arg Gly Ala Asp Asp Ser Thr Gly Ala Asp Lys
100 105 110

Leu Leu Phe Asn Val Ser Arg Glu Asp Phe Phe Lys Ala Leu Glu Ala
115 120 125

Glu Val Gln Arg Val Ile Ala Glu Pro Asp Arg Gln Arg Val Leu Ala
130 135 140

Ala Cys Arg Arg His Leu Asn Ala Ala Arg Leu Pro Gly Arg Glu Leu
145 150 155 160

Arg Pro Pro Arg Phe Asp Asn Arg Ala Val Gly Arg Cys Arg Trp Gln
165 170 175

Asp Cys Pro Arg Arg Pro Arg Arg Arg Ala Asn Ala Val Glu Glu Asn
180 185 190

Leu Arg Gln Thr Leu Tyr Glu Trp Leu Lys Pro Val Phe Gly Glu Ala
195 200 205
Leu Ala Gly Leu Glu Gln Ala Glu Ala Ala Lys Ala Lys Ser Lys Met
210 215 220

Cys Ala Glu Leu Asp His Trp Cys Ser Leu Leu Ala Lys Leu Ala Ala
225 230 235 240
Glu Tyr Arg Lys Leu Ala Asp Glu Gln Pro Asp Gln Arg Asp Glu Lys
245 250 255
Ala Ile Lys Lys Val Ser Ala Leu Leu Glu Arg Arg Lys Asn Glu Leu
260 265 270
Tyr Gln Lys Ile Val Asp Trp Ala Gln Glu Asn Ala Pro Ala Lys Ala
275 280 285

Gly Arg Lys Phe Ala Glu Asp Phe Glu Ala Tyr Cys Asp Lys Lys Arg
290 295 300
Ser Lys Gly Lys Gln Lys Trp Glu Gly Val Ser Ala Ala Gly Ala Thr
305 310 315 320
Gln Ala Gly Ala Val Gly Gln Lys Lys Lys Lys Lys Lys Lys Lys Arg
325 330 335
Gly Phe Gly Asn Gln Leu Asp Asp Ile Val Val Lys Gly Arg Ala Gly
340 345 350

Arg Leu Gln Tyr Cys Arg Glu His Thr Glu Gln Tyr Ile Gln Tyr Phe
355 360 365
Leu Glu Gly Lys Pro Ile Pro Asn Arg Glu Asp Val Leu Asp Arg Asp
370 375 380
Ile Arg Ser Arg Arg Gln Lys Ile Val Phe Asp Arg Leu Trp Ala Leu
385 390 395 400
Ile Arg Gly Arg Leu Leu Pro Leu Ala Gly Gly Arg Ile Asp Arg Ile
405 410 415

Val Val Glu Arg Val Ala Phe Asp Val Leu Ala Gly Thr Phe Ala Asp
420 425 430
Cys Gln Glu Leu Phe Arg Thr Asp Glu Glu Lys Ala Ala Glu Met Tyr

435 440 445

Trp Phe Gly Pro Arg His Gly Phe Lys Asn Glu Leu Glu Met Leu Arg

450 455 460

Thr Glu Phe Ala Gly Arg Cys Ala Tyr Cys Gly Gln Gln Phe Gln Asp

465 470 475 480

Leu Glu Val Glu His Ile Leu Pro Arg Ser Arg Phe Pro Phe Asp Ser

485 490 495

Tyr Leu Val Lys Val Pro Ala Cys Arg Gln Cys Asn Met Lys Lys Gly

500 505 510

Gly Arg Ser Ile Leu Glu Ala Gln Met Arg Ile His Pro Asp Ala Tyr

515 520 525

Asp Ala Tyr Glu Gln Tyr Leu Glu Lys Arg Glu Val Arg His Tyr Phe

530 535 540

Cys Asp Ile Lys Lys Gly Val Leu Lys Leu Leu Thr Asn Gly Ala Gln

545 550 555 560

Asn Trp Gly Phe Glu Arg Leu Leu Gly Met Ile Ala His Asn Ile Phe

565 570 575

Glu Gln Gly Lys Ser Gln Asn Ala Pro Arg Ala Leu Gly Arg Trp Leu

580 585 590

Ala Gly Lys Leu Glu Arg Glu Thr Gly Val Arg Pro Lys Val Val Phe

595 600 605

Leu Ser Gly Arg His Thr Ala Ala Trp Arg Gln Gln Val Leu Pro Asp

610 615 620

Tyr Glu Lys Ala Ala Glu Lys Ala Glu Gly Lys Lys Arg Asn His Ala

625 630 635 640

Val Asp Ala Ile Leu Leu Gly Cys Asp Phe Pro Pro Val Ala Phe Leu

645 650 655

Asp Ser Gln Arg Lys Trp Trp Leu Ser Glu Asp Arg Leu Arg Arg Trp

660 665 670

Glu Glu Gln Val Lys Ala Ala Ala Pro Glu Leu Ala Asp Leu Ala Gly

675 680 685

Asp Gly Asp Ala Ala Pro Ala Arg Leu Pro Arg Val Glu Ala Pro Pro
690 695 700
Pro Ile Arg Phe Phe Glu Glu Asp Leu Gly Gly Gly Tyr Phe Lys Ile
705 710 715 720
Asp Leu Ser Ala Phe Gly Trp Asn Arg Arg Arg Gln Ser Gly Ala Lys
725 730 735

Val Asp Pro Val Arg Met Ile Thr Thr Ala Asn Gly Lys Leu Val Ala
740 745 750
Lys Arg Glu Pro Ala Gln Ala Val Leu Lys Asp Leu Leu Ala Glu Lys
755 760 765
Gln Arg Asp Lys Arg Ile Lys Leu Ile Ala Asn Arg Arg Leu Arg Gln
770 775 780
Leu Leu Gln Ser Asp Pro Ala Asn Ala Ala Arg Asn Tyr Val Leu Trp
785 790 795 800

Leu Gln Arg Gln Thr Ala Arg Gly Leu Arg Ala Ala Lys Met Gly Asn
805 810 815
His Pro Ala Asp Thr Lys Arg Arg Glu Met Leu Glu Gln Phe Ile Asn
820 825 830
Thr Pro Val Asp Asp Phe Leu Arg Ser Gly Lys Arg Arg Thr Ala Lys
835 840 845
Lys Ala Gln Gln Gln Thr Gln Ser Ser Asp Gly Arg Gly Ser Gly Gln
850 855 860

Ser Ala Ala Glu Gln Thr Ser Ala Ala Glu Ile Pro Ala Ile Ile Gly
865 870 875 880
Val Cys Cys Leu Ile Ala Gln Lys Tyr Thr Lys Tyr Asp Val Pro Arg
885 890 895
Cys Asp Arg Asn Gly Lys Pro Leu His Tyr Tyr Ala Ser Gln Pro Ala
900 905 910
Ile Arg Ala Leu Tyr Val Gly Tyr Lys Arg Arg Lys Asp Gly Arg Leu
915 920 925

Asp Arg Ser Lys Pro Glu Ile Phe Arg Val Asn Gln Val Trp Lys Val

930 935 940

Tyr Tyr Gly Pro Pro Gly Lys Asp Gln Asp Ser Pro Lys Ala Arg Lys
945 950 955 960

Val Ile Glu Lys Leu Gly Gln Asp Ser Pro Leu His Gly Arg Met Leu
965 970 975

Gly Gln Arg Gly Ser Trp Gln Glu Phe Arg Lys Arg Trp His Glu Ala
980 985 990

Phe Gly Arg Leu Trp Ala Asp Leu Gly Val Glu Lys Arg Phe Gln Ile
995 1000 1005

Ala Gln Gly Ala Val Ile Glu Lys Thr Asp Gly Thr Cys Phe Leu
1010 1015 1020

Val Arg Asn Phe Asp Asn Thr Glu Gly Trp Met Arg Gly Ser Pro
1025 1030 1035

Trp Lys Asp Ile Arg Arg Val Tyr Arg Ser Pro Leu His Tyr Leu
1040 1045 1050

Ser Ala Lys Ala Lys Ala Ala Phe Asp His Ser Ser Arg Ser Ala
1055 1060 1065

Ala Thr Val Ala Glu Thr Ile Asn
1070 1075

<210> 593

<211> 1076

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG102 effectors

<220><223> Description: MG102-13 effector

<400> 593

Met Ser Val Thr Leu Thr Ile Asp Pro Gly Ser Arg Asn Ile Gly Leu
1 5 10 15

Ala Leu Val Arg Ser Arg Ala Gly Asp Arg Pro Ser Ala Leu Tyr Ala
20 25 30

Ala Cys Ile Val Ala Glu Pro Lys Pro Leu Lys Glu Leu Val Val Arg
35 40 45
Arg Ala Gln Leu Arg Arg Met Arg Arg Thr Arg Lys Thr Arg Arg Arg
50 55 60
Arg Leu Arg Arg Leu Ala Asp Ala Leu Arg Gly Ile Ala Gly Ala Glu
65 70 75 80

Ala Ile Val Arg Phe Cys Arg Arg Arg Gly Tyr Ser His Asp Pro Lys
85 90 95
Arg Ala Arg Asp Gly Arg Gly Ala Asp Asp Ser Thr Gly Ala Asp Lys
100 105 110
Leu Leu Phe Asn Val Ser Arg Glu Asp Phe Phe Lys Ala Leu Glu Ala
115 120 125
Glu Val Gln Arg Val Ile Ala Glu Pro Asp Arg Gln Arg Val Leu Ala
130 135 140

Ala Cys Arg Arg His Leu Asn Ala Ala Arg Leu Pro Gly Arg Glu Leu
145 150 155 160
Arg Pro Pro Arg Phe Asp Asn Arg Ala Val Gly Arg Cys Arg Trp Gln
165 170 175
Asp Cys Pro Arg Arg Pro Pro Arg Arg Ala Asn Ala Val Glu Glu Asn
180 185 190
Leu Arg Gln Thr Leu Tyr Glu Trp Leu Lys Pro Val Phe Gly Glu Ala
195 200 205

Leu Ala Gly Leu Glu Gln Ala Glu Ala Ala Lys Ala Lys Ser Lys Met
210 215 220
Cys Ala Glu Leu Asp His Trp Cys Ser Leu Leu Ala Lys Leu Ala Ala
225 230 235 240
Glu Tyr Arg Lys Leu Ala Asp Glu Gln Pro Asp Gln Arg Asp Glu Lys
245 250 255
Ala Ile Lys Lys Val Ser Ala Leu Leu Glu Arg Arg Lys Asn Glu Leu
260 265 270

Tyr Gln Lys Ile Val Asp Trp Ala Gln Glu Asn Ala Pro Ala Lys Ala

275 280 285

Gly Arg Lys Phe Ala Glu Asp Phe Glu Ala Tyr Cys Asp Lys Lys Arg

290 295 300

Ser Lys Gly Lys Gln Lys Trp Glu Gly Val Ser Ala Ala Gly Ala Thr

305 310 315 320

Gln Ala Gly Ala Val Gly Gln Lys Lys Lys Lys Lys Lys Lys Lys Arg

325 330 335

Gly Phe Gly Asn Gln Leu Asp Asp Ile Val Val Lys Gly Arg Ala Gly

340 345 350

Arg Leu Gln Tyr Cys Arg Glu His Thr Glu Gln Tyr Ile Gln Tyr Phe

355 360 365

Leu Glu Gly Lys Pro Ile Pro Asn Arg Glu Asp Val Leu Asp Arg Asp

370 375 380

Ile Arg Ser Arg Arg Gln Lys Ile Val Phe Asp Arg Leu Trp Ala Leu

385 390 395 400

Ile Arg Gly Arg Leu Leu Pro Leu Ala Gly Gly Arg Ile Asp Arg Ile

405 410 415

Val Val Glu Arg Val Ala Phe Asp Val Leu Ala Gly Thr Phe Ala Asp

420 425 430

Cys Gln Glu Leu Phe Arg Thr Asp Glu Glu Lys Ala Ala Glu Met Tyr

435 440 445

Trp Phe Gly Pro Arg His Gly Phe Lys Asn Glu Leu Glu Met Leu Arg

450 455 460

Thr Glu Phe Ala Gly Arg Cys Ala Tyr Cys Gly Gln Gln Phe Gln Asp

465 470 475 480

Leu Glu Val Glu His Ile Leu Pro Arg Ser Arg Phe Pro Phe Asp Ser

485 490 495

Tyr Leu Val Lys Val Pro Ala Cys Arg Gln Cys Asn Met Lys Lys Gly

500 505 510

Gly Arg Ser Ile Leu Glu Ala Gln Met Arg Ile His Pro Asp Ala Tyr

515 520 525

Asp Ala Tyr Glu Gln Tyr Leu Glu Lys Arg Glu Val Arg His Tyr Phe
530 535 540
Cys Asp Ile Lys Lys Gly Val Leu Lys Leu Leu Thr Asn Gly Ala Gln
545 550 555 560
Asn Trp Gly Phe Glu Arg Leu Leu Gly Met Ile Ala His Asn Ile Phe
565 570 575
Glu Gln Gly Lys Ser Gln Asn Ala Pro Arg Ala Leu Gly Arg Trp Leu
580 585 590

Ala Gly Lys Leu Glu Arg Glu Thr Gly Val Arg Pro Lys Val Val Phe
595 600 605
Leu Ser Gly Arg His Thr Ala Ala Trp Arg Gln Gln Val Leu Pro Asp
610 615 620
Tyr Glu Lys Ala Ala Glu Lys Ala Glu Gly Lys Lys Arg Asn His Ala
625 630 635 640
Val Asp Ala Ile Leu Leu Gly Cys Asp Phe Pro Pro Val Ala Phe Leu
645 650 655

Asp Ser Gln Arg Lys Trp Trp Leu Ser Glu Asp Arg Leu Arg Arg Trp
660 665 670
Glu Glu Gln Val Lys Ala Ala Ala Pro Glu Leu Ala Asp Leu Ala Gly
675 680 685
Asp Gly Asp Ala Ala Pro Ala Arg Leu Pro Arg Val Glu Ala Pro Pro
690 695 700
Pro Ile Arg Phe Phe Glu Glu Asp Leu Gly Gly Gly Tyr Phe Lys Ile
705 710 715 720

Asp Leu Ser Ala Phe Gly Trp Asn Arg Arg Arg Gln Ser Gly Ala Lys
725 730 735
Val Asp Pro Val Arg Met Ile Thr Thr Ala Asn Gly Lys Leu Val Ala
740 745 750
Lys Arg Glu Pro Ala Gln Ala Val Leu Lys Asp Leu Leu Ala Glu Lys
755 760 765
Gln Arg Asp Lys Arg Ile Lys Leu Ile Ala Asn Arg Arg Leu Arg Gln

770 775 780

Leu Leu Gln Ser Asp Pro Ala Asn Ala Ala Arg Asn Tyr Val Leu Trp
785 790 795 800
Leu Gln Arg Gln Thr Ala Arg Gly Leu Arg Ala Ala Lys Met Gly Asn
805 810 815
His Pro Ala Asp Thr Lys Arg Arg Glu Met Leu Glu Gln Phe Ile Asn
820 825 830
Thr Pro Val Asp Asp Phe Leu Arg Ser Gly Lys Arg Arg Thr Ala Lys
835 840 845

Lys Ala Gln Gln Gln Thr Gln Ser Ser Asp Gly Arg Gly Asn Gly Gln
850 855 860
Ser Ala Ala Glu Gln Thr Ser Ala Ala Glu Ile Pro Ala Ile Ile Gly
865 870 875 880
Val Cys Cys Leu Ile Ala Gln Lys Tyr Thr Lys Tyr Asp Val Pro Arg
885 890 895
Cys Asp Arg Asn Gly Lys Pro Leu His Tyr Tyr Ala Ser Gln Pro Ala
900 905 910

Ile Arg Ala Leu Tyr Val Gly Tyr Lys Arg Arg Lys Asp Gly Arg Leu
915 920 925
Asp Arg Ser Lys Pro Glu Ile Phe Arg Val Asn Gln Val Trp Lys Val
930 935 940
Tyr Tyr Gly Pro Pro Gly Gln Asp Gln Asp Ser Pro Lys Ala Arg Lys
945 950 955 960
Val Ile Glu Lys Leu Gly Gln Asp Ser Pro Leu His Gly Arg Met Leu
965 970 975

Gly Gln Arg Gly Ser Trp Gln Glu Phe Arg Lys Arg Trp His Glu Ala
980 985 990
Phe Gly Arg Leu Trp Ala Asp Leu Gly Val Glu Lys Arg Phe Gln Ile
995 1000 1005
Ala Gln Gly Ala Val Ile Glu Lys Thr Asp Gly Thr Cys Phe Leu
1010 1015 1020

Val Arg Asn Phe Asp Asn Thr Glu Gly Trp Met Arg Gly Ser Pro
1025 1030 1035

Trp Lys Asp Ile Arg Arg Val Tyr Arg Ser Pro Leu His Tyr Leu
1040 1045 1050
Ser Ala Lys Ala Lys Ala Ala Phe Asp His Ser Ser Arg Ser Ala
1055 1060 1065
Ala Thr Val Ala Glu Thr Ile Asn
1070 1075

<210> 594
<211> 949
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG102 effectors
<220><223> Description: MG102-14 effector

<400> 594
Met Ile Thr Leu Ala Ile Asp Tyr Gly Ala Ser Asn Ile Gly Ile Ala
1 5 10 15
Leu Val Arg Asn Thr Glu Glu Gly Asn Glu Pro Leu Phe Ala Gly Thr
20 25 30
Ile Ile Ile Asp Ala Lys Gly Val Lys Asp Leu Ala Glu Pro Arg Ala
35 40 45
Ala Ile Arg Arg Leu Arg Arg Thr Arg Lys Thr Lys Ile Arg Arg Leu
50 55 60

Arg Gln Leu Ser Leu Ala Leu Lys Arg Leu Gly Leu Gly Glu Glu Val
65 70 75 80
Ser Arg Ile Val Arg Phe Ala Arg Arg Arg Gly Tyr Lys Ser Leu Phe
85 90 95
Asp Asp Pro Asp Glu Ala Lys Gln Thr Lys Asp Asp Val Ser Gly Tyr
100 105 110
Arg Cys Thr Arg Glu Glu Phe Phe His Glu Leu Glu His Glu Leu Gln

115 120 125

Ala Ile Ile Ile Asp Thr Glu Gln Tyr His Arg Ala Leu Ser Val Cys
130 135 140
Glu Arg Val Leu Asn Arg Arg Gly Glu Arg Tyr Gly Glu Ile Arg Pro
145 150 155 160
Leu Lys Ile Asp Asn Arg Gly Arg Ser Arg Cys Ala Trp Glu Gly Cys
165 170 175
Asn Arg Val Thr Pro Arg Arg His Asn Ala Thr Asp Asp Val Val Arg
180 185 190

Gln Gln Leu Val Thr Tyr Phe Gln Ser Pro Leu Arg Arg Glu Pro Gly
195 200 205
Lys Leu Pro Met Leu Glu Gln Ala Val Val Lys Leu Asp Ile Ile Ser
210 215 220
Lys Asn Leu Arg Gly Ser Asn Glu Ala Lys Cys Arg Asn Ala Leu Asn
225 230 235 240
Lys Arg Ala Arg Thr Ile Leu Arg Gly Leu Gln Ala Ala Leu Pro Met
245 250 255

His Glu Asp Glu Gly Gly Ser Asp Lys Glu Ser Trp Glu Tyr Val Glu
260 265 270
Lys Gly Ile Val Lys Ile Leu Glu Asn Ala Gly Gly Arg Asn Arg Tyr
275 280 285
Cys Arg Glu His Ser Lys Ala Tyr Cys Asp Arg Val Leu Glu Gly Lys
290 295 300
Pro Ser Glu Phe Lys Ser Ser Ile Gln Glu Ser Asp Ile Ile Ser Arg
305 310 315 320

Arg Glu Gln Ile Ile Phe Asn Lys Leu Trp Arg Tyr Ile Glu Ala Arg
325 330 335
Leu Leu Pro Leu Ala Pro Glu Gly Ile Asp Arg Ile Val Val Glu Arg
340 345 350
Thr Ala Phe Asp Leu Leu Ala Gly Lys Gln Lys Lys Ile Arg Asp Ala
355 360 365

Ser Ser Lys Ser Val Glu Ser Ile Tyr Gln Tyr Gly Pro Arg Tyr Gly
370 375 380

Phe Thr Ser Glu Lys Glu Met Leu Arg Lys Glu Phe Gly Gly Leu Cys
385 390 395 400
Ala Tyr Cys Gly Lys Pro Ser Glu Thr Leu Leu Glu Arg Glu His Ile
405 410 415
Leu Pro Arg Arg Leu Phe Phe Phe Asp Ser Tyr Leu Asn Ile Leu Pro
420 425 430
Ser Cys Pro Gln Cys Asn Ala Ala Lys Gly Thr Ser Leu Pro Gly Val
435 440 445

Ser Ser Leu Arg Ile His Glu Asp Ala Tyr Arg Asn Tyr Glu Ser Tyr
450 455 460
Ile Asn Glu Leu Lys Ser Lys Arg Pro Leu His Phe Leu His Thr Glu
465 470 475 480
Lys Lys Gly Ile Leu Asn Leu Met Arg Asp Pro Glu Arg Ala Trp Asp
485 490 495
Trp Glu Arg Tyr Leu Arg Leu Ile Ala Asn Asn Phe Ala Ser Ile Val
500 505 510

Gln Thr Gln Arg Gly Pro Arg Pro Phe Ala Arg Tyr Leu Tyr Ser Lys
515 520 525
Leu Ser Arg Arg Gln Glu Lys Pro Pro Glu Ile Ala Phe Arg Ser Gly
530 535 540
Arg His Thr Ala Leu Tyr Arg Ser Val Ala Tyr Pro Asp Phe Ser Lys
545 550 555 560
Ala Gln Glu Lys Ala Gly Glu Asp Gly Asn Ser His Pro Val Asn His
565 570 575

Ala Leu Asp Ala Leu Leu Leu Ala Ser Lys Leu Pro Arg Pro Glu Pro
580 585 590
Leu Glu Ala Arg Gly Leu Asn His Ala Ser Leu Lys Ala Trp Ala Asp
595 600 605
Gln Val Arg Gly Lys Ala Ala Pro Ala Gly Glu Asp Gly Ile Pro Val

610 615 620

Ile Pro Ala Tyr Lys Cys Phe Val Pro Gly Phe Glu Glu Thr Asp Ala

625 630 635 640

His Gly Tyr Val Thr Val Glu Met Ala Met Met Asn Trp Asn Lys Lys

645 650 655

Asp Thr Ala Thr Thr Lys Gln Asp Pro Tyr Gly Trp Ser Glu Ser Arg

660 665 670

Gln His Pro Thr Lys Arg Val Ser Ala Arg Thr Leu Phe Asp Asp Leu

675 680 685

Arg Glu Glu Lys Ser Lys Lys Asn Pro Ser Glu Leu Ile Lys Arg Ile

690 695 700

Tyr His Pro Ala Leu Arg Ser Ala Val Glu Lys Ala Tyr Gln Glu Ser

705 710 715 720

His Asn Arg Ile Gln Ala Ala Glu Ala Leu Lys Asn Trp Leu Arg Asp

725 730 735

Ser Val Lys Asn Ser Leu Arg Ser Ser Ser Phe Ser Arg His Pro Ser

740 745 750

Asp Ile Arg Arg Arg Gln Asp Leu Glu Arg Phe Ala Asn Gly Lys Thr

755 760 765

Asp Glu Ile Pro Val Val Ile Gly Ile Lys Cys Leu Asp Thr Gly Val

770 775 780

Ala Gly Lys Ile Asp Ala Ala Arg Met Asp Arg Gln Thr Gly Thr Thr

785 790 795 800

Gly His Arg Tyr Leu Thr Asp Pro Ala Asn Arg Gly Val Val Leu Ala

805 810 815

Tyr Pro Thr Thr Arg Ser Gly Ala Cys Asp Arg Arg Lys Pro Cys Thr

820 825 830

Ala Gly Ile Arg Gln Asn Tyr Ser Leu Lys Thr Asp Glu Thr Ala Phe

835 840 845

Arg Ser Met Pro Ala Ser Leu Glu Arg Gly Val Val Trp Gly Lys Lys

850 855 860

Thr His Ser Pro Arg Ala Met Glu Ser Ala Phe Ser Lys Glu Leu Glu
865 870 875 880
Gln Tyr Leu Arg Asp Arg Arg Phe His Ser Tyr Cys Ile Leu Thr Ala
885 890 895

Gly Cys Val Val Cys Tyr Glu Asp Gly Thr Glu Arg Phe Ile Arg Asn
900 905 910
Phe Asp Lys Ser Lys Gly Phe Lys Lys Thr Ile Leu Arg Asn Ile Val
915 920 925
Ala Leu Lys Arg Thr Pro Leu Ser Thr Arg Val Val Pro Leu Lys Val
930 935 940
Leu Thr Ala Leu Pro
945

<210> 595
<211> 1074
<212> PRT
<213> Unknown
<220><223> Description of Unknown:

uncultivated organism
<220><223> Category: MG102 effectors
<220><223> Description: MG102-15 effector
<400> 595
Met Ser Val Thr Leu Thr Ile Asp Pro Gly Ser Arg Asn Ile Gly Leu
1 5 10 15
Ala Leu Val Arg Ser Arg Ala Gly Asp Arg Pro Ser Ala Leu Tyr Ala
20 25 30
Ala Cys Ile Val Ala Glu Pro Lys Pro Leu Lys Glu Leu Val Val Arg
35 40 45

Arg Ala Gln Leu Arg Arg Met Arg Arg Thr Arg Lys Thr Arg Arg Arg
50 55 60
Arg Leu Arg Arg Leu Ala Asp Ala Leu Arg Gly Ile Ala Gly Ala Glu
65 70 75 80
Ala Ile Val Arg Phe Cys Arg Arg Arg Gly Tyr Ser His Asp Pro Lys

85 90 95

Arg Ala Arg Asp Gly Arg Gly Ala Asp Asp Ser Thr Gly Ala Asp Lys

100 105 110

Leu Leu Phe Asn Val Ser Arg Glu Asp Phe Phe Lys Ala Leu Glu Ala

115 120 125

Glu Val Gln Arg Val Ile Ala Glu Pro Asp Arg Gln Arg Val Leu Ala

130 135 140

Ala Cys Arg Arg His Leu Asn Ala Ala Arg Leu Pro Gly Arg Glu Leu

145 150 155 160

Arg Pro Pro Arg Phe Asp Asn Arg Ala Val Gly Arg Cys Arg Trp Gln

165 170 175

Asp Cys Pro Arg Arg Pro Arg Arg Arg Ala Asn Ala Val Glu Glu Asn

180 185 190

Leu Arg Gln Thr Leu Tyr Glu Trp Leu Lys Pro Val Phe Gly Glu Ala

195 200 205

Leu Ala Gly Leu Glu Gln Ala Glu Ala Ala Lys Ala Lys Ser Lys Met

210 215 220

Cys Ala Glu Leu Asp His Trp Cys Ser Leu Leu Ala Lys Leu Ala Ala

225 230 235 240

Glu Tyr Arg Lys Leu Ala Asp Glu Gln Pro Asp Gln Arg Asp Glu Lys

245 250 255

Ala Ile Lys Lys Val Ser Ala Leu Leu Glu Arg Arg Lys Asn Glu Leu

260 265 270

Tyr Gln Lys Ile Val Asp Trp Ala Gln Glu Asn Ala Pro Ala Lys Ala

275 280 285

Gly Arg Lys Phe Ala Glu Asp Phe Glu Ala Tyr Cys Asp Lys Lys Arg

290 295 300

Ser Lys Gly Lys Gln Lys Trp Glu Gly Val Ser Ala Ala Gly Ala Thr

305 310 315 320

Gln Ala Gly Ala Val Gly Gln Lys Lys Lys Lys Lys Lys Lys Lys Arg

325 330 335

Gly Phe Gly Asn Gln Leu Asp Asp Ile Val Val Lys Gly Arg Ala Gly
340 345 350
Arg Leu Gln Tyr Cys Arg Glu His Thr Glu Gln Tyr Ile Gln Tyr Phe
355 360 365

Leu Glu Gly Lys Pro Ile Pro Asn Arg Glu Asp Val Leu Asp Arg Asp
370 375 380
Ile Arg Ser Arg Arg Gln Lys Ile Val Phe Asp Arg Leu Trp Ala Leu
385 390 395 400
Ile Arg Gly Arg Leu Leu Pro Leu Ala Gly Gly Arg Ile Asp Arg Ile
405 410 415
Val Val Glu Arg Val Ala Phe Asp Val Leu Ala Gly Thr Phe Ala Asp
420 425 430

Cys Gln Glu Leu Phe Arg Thr Asp Glu Glu Lys Ala Ala Glu Met Tyr
435 440 445
Trp Phe Gly Pro Arg His Gly Phe Lys Asn Glu Leu Glu Met Leu Arg
450 455 460
Thr Glu Phe Ala Gly Arg Cys Ala Tyr Cys Gly Gln Gln Phe Gln Asp
465 470 475 480
Leu Glu Val Glu His Ile Leu Pro Arg Ser Arg Phe Pro Phe Asp Ser
485 490 495

Tyr Leu Val Lys Val Pro Ala Cys Arg Gln Cys Asn Met Lys Lys Gly
500 505 510
Gly Arg Ser Ile Leu Glu Ala Gln Met Arg Ile His Pro Asp Ala Tyr
515 520 525
Asp Ala Tyr Glu Arg Tyr Leu Glu Lys Arg Glu Val Arg His Cys Phe
530 535 540
Cys Asp Ile Lys Lys Gly Val Leu Lys Leu Leu Thr Asn Gly Ala Gln
545 550 555 560

Asn Trp Gly Phe Glu Arg Leu Leu Gly Met Ile Ala His Asn Ile Phe
565 570 575
Glu Gln Gly Lys Ser Gln Asn Ala Pro Arg Ala Leu Gly Arg Trp Leu

580 585 590

Ala Gly Lys Leu Glu Arg Glu Thr Gly Val Arg Pro Glu Val Val Phe

595 600 605

Leu Ser Gly Arg Tyr Thr Ala Ala Trp Arg Gln Gln Val Leu Pro Asp

610 615 620

Tyr Glu Lys Ala Ala Glu Lys Ala Glu Gly Lys Lys Arg Asn His Ala

625 630 635 640

Val Asp Ala Ile Leu Leu Gly Cys Ile Pro Lys Val Lys Phe Asp Ser

645 650 655

Gln Arg Lys Trp Trp Leu Ser Glu Asp Arg Leu Arg Gly Trp Glu Glu

660 665 670

Gln Val Lys Ala Ala Ala Pro Glu Leu Ala Asp Leu Ala Gly Asp Gly

675 680 685

Asp Ala Ala Pro Ala Arg Leu Pro Arg Val Glu Ala Pro Pro Pro Ile

690 695 700

Arg Phe Phe Glu Glu Asp Leu Gly Gly Gly Tyr Phe Lys Ile Asp Leu

705 710 715 720

Ser Ala Phe Gly Trp Asn Arg Arg Arg Gln Ser Gly Ala Lys Val Asp

725 730 735

Pro Val Arg Met Ile Thr Thr Ala Asn Gly Lys Leu Val Ala Lys Arg

740 745 750

Glu Pro Ala Gln Thr Val Leu Lys Tyr Leu Leu Asp Glu Glu Gln Arg

755 760 765

Asp Lys Arg Ile Gly Leu Ile Ala Asn Arg Arg Leu Arg Gln Leu Leu

770 775 780

Gln Ser Asp Pro Ala Asn Ala Ala Arg Asn Tyr Val Leu Trp Leu Gln

785 790 795 800

Arg Gln Thr Ala Arg Gly Leu Arg Ala Ala Lys Met Gly Asn His Pro

805 810 815

Ala Asp Thr Lys Arg Arg Glu Met Leu Glu Gln Phe Ile Asn Thr Pro

820 825 830

Val Asp Asp Phe Leu Arg Ser Gly Lys Arg Arg Thr Ala Lys Lys Ala
835 840 845
Gln Gln Gln Thr Gln Ser Ser Asp Gly Arg Gly Asn Gly Gln Ser Ala
850 855 860
Ala Glu Gln Thr Ser Ala Ala Glu Ile Pro Ala Ile Ile Gly Val Cys
865 870 875 880

Cys Leu Ile Glu Gln Lys Tyr Thr Lys Tyr Asp Val Pro Arg Cys Asp
885 890 895
Arg Asn Gly Lys Pro Leu His Tyr Tyr Ala Ser Gln Pro Ala Ile Arg
900 905 910
Ala Leu Tyr Val Gly Tyr Lys Arg Arg Lys Asp Gly Arg Leu Asp Arg
915 920 925
Ser Lys Pro Glu Ile Phe Arg Val Asn Gln Val Trp Lys Val Tyr Tyr
930 935 940

Gly Pro Pro Gly Gln Asp Gln Asp Ser Pro Lys Ala Arg Lys Val Ile
945 950 955 960
Glu Lys Leu Gly Gln Asp Ser Pro Leu His Gly Arg Met Leu Gly Gln
965 970 975
Arg Gly Ser Trp Gln Glu Phe Arg Lys Arg Trp His Glu Ala Phe Ala
980 985 990
Arg Leu Trp Ala Asp Leu Gly Val Glu Lys Arg Phe Gln Ile Ala Gln
995 1000 1005

Gly Ala Val Ile Glu Lys Thr Asp Gly Thr Cys Phe Leu Val Arg
1010 1015 1020
Asn Phe Asp Asn Thr Glu Gly Trp Met Arg Gly Ser Pro Trp Lys
1025 1030 1035
Asp Ile Arg Arg Val Tyr Arg Ser Pro Leu His Tyr Leu Ser Ala
1040 1045 1050
Lys Ala Lys Ala Ala Phe Asp His Ser Ser Arg Ser Ala Ala Thr
1055 1060 1065

Val Ala Glu Thr Ile Asn

1070

<210> 596

<211> 598

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG102 effectors

<220><223> Description: MG102-16 effector

<400> 596

Ile Asp Thr Leu Tyr Arg Leu Ala Gly Lys Gln Lys Lys Ile Arg Asp
1 5 10 15

Ala Ser Ser Lys Ser Val Glu Ser Ile Tyr Gln Tyr Gly Pro Arg Tyr
20 25 30

Gly Phe Thr Ser Glu Lys Glu Met Leu Arg Lys Glu Phe Gly Gly Leu
35 40 45

Cys Ala Tyr Cys Gly Lys Pro Ser Glu Thr Leu Leu Glu Arg Glu His
50 55 60

Ile Leu Pro Arg Arg Leu Phe Phe Phe Asp Ser Tyr Leu Asn Ile Leu
65 70 75 80

Pro Ser Cys Pro Gln Cys Asn Ala Ala Lys Gly Thr Ser Leu Pro Gly
85 90 95

Val Ser Ser Leu Arg Val His Glu Asp Ala Tyr Arg Asn Tyr Glu Ser
100 105 110

Tyr Ile Asn Glu Leu Lys Ser Lys Arg Pro Leu His Phe Leu His Thr
115 120 125

Glu Lys Lys Gly Ile Leu Asn Leu Met Arg Asp Pro Glu Arg Ala Trp
130 135 140

Asp Trp Glu Arg Tyr Leu Arg Leu Ile Ala Asn Asn Phe Ala Ser Ile
145 150 155 160

Val Gln Thr Gln Arg Gly Pro Arg Pro Phe Ala Arg Tyr Leu Tyr Ser
165 170 175

Lys Leu Ser Arg Arg Gln Glu Lys Pro Pro Glu Ile Ala Phe Arg Ser
180 185 190

Gly Arg His Thr Ala Leu Tyr Arg Ser Val Ala Tyr Pro Asp Phe Ser
195 200 205

Lys Ala Gln Glu Lys Ala Gly Glu Asp Gly Asn Ser His Pro Val Asn
210 215 220

His Ala Leu Asp Ala Leu Leu Leu Ala Ser Lys Leu Pro Arg Pro Glu
225 230 235 240

Pro Leu Glu Ala Arg Gly Leu Asn His Ala Ser Leu Lys Ala Trp Ala
245 250 255

Asp Gln Val Arg Gly Lys Ala Ala Pro Ala Gly Glu Asp Gly Ile Pro
260 265 270

Val Ile Pro Ala Tyr Lys Cys Phe Val Pro Gly Phe Glu Glu Thr Asp
275 280 285

Ala His Gly Tyr Val Thr Val Glu Met Ala Met Met Asn Trp Asn Lys
290 295 300

Lys Asp Thr Ala Thr Thr Lys Gln Asp Pro Tyr Gly Trp Ser Glu Ser
305 310 315 320

Arg Gln His Pro Thr Lys Arg Val Ser Ala Arg Thr Leu Phe Asp Asp
325 330 335

Leu Arg Glu Glu Lys Ser Lys Lys Asn Pro Ser Glu Leu Ile Lys Arg
340 345 350

Ile Tyr His Pro Ala Leu Arg Ser Ala Val Glu Lys Ala Tyr Gln Glu
355 360 365

Ser His Asn Arg Ile Gln Ala Ala Glu Ala Leu Lys Asn Trp Leu Arg
370 375 380

Asp Ser Val Lys Asn Ser Leu Arg Ser Ser Ser Phe Ser Arg His Pro
385 390 395 400

Ser Asp Ile Arg Arg Arg Gln Asp Leu Glu Arg Phe Ala Asn Gly Lys
405 410 415

Thr Asp Glu Ile Pro Val Val Ile Gly Ile Lys Cys Leu Asp Thr Gly

420 425 430

Val Ala Gly Lys Ile Asp Ala Ala Arg Met Asp Arg Gln Thr Gly Thr

435 440 445

Thr Gly His Arg Tyr Leu Thr Asp Pro Ala Asn Arg Gly Val Val Leu

450 455 460

Ala Tyr Pro Thr Thr Arg Ser Gly Ala Cys Asp Arg Arg Lys Pro Cys

465 470 475 480

Thr Ala Gly Ile Arg Gln Asn Tyr Ser Leu Lys Thr Asp Glu Thr Ala

485 490 495

Phe Arg Ser Met Pro Ala Ser Leu Glu Arg Gly Val Val Trp Gly Lys

500 505 510

Lys Thr His Ser Pro Arg Ala Met Glu Ser Ala Phe Ser Lys Glu Leu

515 520 525

Glu Gln His Leu Arg Asp Arg Arg Phe His Ser Tyr Cys Ile Leu Thr

530 535 540

Ala Gly Cys Val Val Cys Tyr Glu Asp Gly Thr Glu Arg Phe Ile Arg

545 550 555 560

Asn Phe Asp Lys Ser Lys Gly Phe Lys Lys Thr Ile Leu Arg Asn Ile

565 570 575

Val Ala Leu Lys Arg Thr Pro Leu Ser Thr Arg Val Val Pro Leu Lys

580 585 590

Val Leu Thr Ala Leu Pro

595

<210> 597

<211> 380

<212> PRT

<213> Unknown

<220><223>

Description of Unknown:

uncultivated organism

<220><223> Category: MG102 effectors

<220><223> Description: MG102-17 effector

<400> 597

Lys Arg Ala Arg Thr Ile Leu Arg Gly Leu Gln Ala Ala Leu Pro Met
1 5 10 15
His Glu Asp Glu Gly Gly Ser Asp Lys Glu Ser Trp Glu Tyr Val Glu
20 25 30
Lys Gly Ile Val Lys Ile Leu Glu Asn Ala Gly Gly Arg Asn Arg Tyr
35 40 45

Cys Arg Glu His Ser Lys Ala Tyr Cys Asp Arg Val Leu Glu Gly Lys
50 55 60
Pro Ser Glu Phe Lys Ser Ser Ile Gln Glu Ser Asp Ile Ile Ser Arg
65 70 75 80
Arg Glu Gln Ile Ile Phe Asn Lys Leu Trp Arg Tyr Ile Glu Ala Arg
85 90 95
Leu Leu Pro Leu Ala Pro Glu Gly Ile Asp Arg Ile Val Val Glu Arg
100 105 110

Thr Ala Phe Asp Leu Leu Ala Gly Lys Gln Lys Lys Ile Arg Asp Ala
115 120 125
Ser Ser Lys Ser Val Glu Ser Ile Tyr Gln Tyr Gly Pro Arg Tyr Gly
130 135 140
Phe Thr Ser Glu Lys Glu Met Leu Arg Lys Glu Phe Gly Gly Leu Cys
145 150 155 160
Ala Tyr Cys Gly Lys Pro Ser Glu Thr Leu Leu Glu Arg Glu His Ile
165 170 175

Leu Pro Arg Arg Leu Phe Phe Phe Asp Ser Tyr Leu Asn Ile Leu Pro
180 185 190
Ser Cys Pro Gln Cys Asn Ala Ala Lys Gly Thr Ser Leu Pro Gly Val
195 200 205
Ser Ser Leu Arg Val His Glu Asp Ala Tyr Arg Asn Tyr Glu Ser Tyr
210 215 220
Ile Asn Glu Leu Lys Ser Lys Arg Pro Leu His Phe Leu His Thr Glu
225 230 235 240

Lys Lys Gly Ile Leu Asn Leu Met Arg Asp Pro Glu Arg Ala Trp Asp

245 250 255

Trp Glu Arg Tyr Leu Arg Leu Ile Ala Asn Asn Phe Ala Ser Ile Val

260 265 270

Gln Thr Gln Arg Gly Pro Arg Pro Phe Ala Arg Tyr Leu Tyr Ser Lys

275 280 285

Leu Ser Arg Arg Gln Glu Lys Pro Pro Glu Ile Ala Phe Arg Ser Gly

290 295 300

Arg His Thr Ala Leu Tyr Arg Ser Val Ala Tyr Pro Asp Phe Ser Lys

305 310 315 320

Ala Gln Glu Lys Ala Gly Glu Asp Gly Asn Ser His Pro Val Asn His

325 330 335

Ala Leu Asp Ala Leu Leu Leu Ala Ser Lys Leu Pro Arg Pro Glu Pro

340 345 350

Leu Glu Ala Arg Gly Leu Asn His Ala Ser Leu Lys Ala Trp Ala Asp

355 360 365

Gln Val Arg Gly Lys Ala Ala Pro Ala Gly Glu Asp

370 375 380

<210> 598

<211> 491

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG102 effectors

<220><223> Description: MG102-18 effector

<400> 598

Met Ser Pro Pro Thr Ser Ala Ile Pro Ala Thr Thr Leu Ala Ile Asp

1 5 10 15

Phe Gly Gln Arg Tyr Ile Gly Val Ala Leu Val Glu His Ser Gln Glu

20 25 30

Asp Pro Asn Arg Val Leu Tyr Ala Ala Thr Ile Val Val Glu Ser Lys

35 40 45

Pro Leu Lys Ala Leu Val Glu Pro Arg Ser Gly Thr Arg Arg Ile Arg

50 55 60

Arg Thr Arg Lys Thr His Gln Arg Arg Leu Ala Arg Leu Ala Gln Ser

65 70 75 80

Leu Ala Asp Val Pro Gly Val Glu Gly Ile Leu Arg Phe Cys Ser Arg

85 90 95

Arg Gly Phe Ser Tyr Asp Ala Asp Glu Thr Asp Glu Glu Ala Phe His

100 105 110

Val Ser Arg Glu Glu Phe Phe Ser Ala Leu Glu Ala Glu Ile Glu Gln

115 120 125

Thr Ile Pro Pro Pro Phe Gln Gly Arg Val Leu Ala Ala Cys Glu Arg

130 135 140

His Leu Asn Arg Ser Arg Arg Arg Gly Ala Glu Leu Arg Pro Ala Arg

145 150 155 160

Phe Glu Asn Arg Gly Arg Ala Arg Cys Gln Trp Ala Gly Cys Thr His

165 170 175

Asn Val Pro Arg Ala Glu His Asp Leu Val Gly Arg Leu Gln Gln Ser

180 185 190

Leu Phe Leu Trp Leu Gln Pro Val Phe Ala Glu Ser Ser Asp Pro Ala

195 200 205

Arg Leu Arg Lys Ser Val Asp His Trp Ile Arg Glu Leu Ala Ala Ala

210 215 220

Ser Val Ala Leu Ala Arg Gln Ala Pro Pro Asp Glu Pro Ser Ala Asp

225 230 235 240

Asp Ala Arg Gly Ala Arg Arg Ala Ile His Ala Arg Ile Lys Arg Val

245 250 255

Tyr Gln Asn Leu Leu Arg Arg Val His Ala Glu Ala Pro Glu Ala Ala

260 265 270

Asp Ser Phe Ala Glu Asn Trp Lys Glu Tyr Tyr Gln Pro Val Ile Ser

275 280 285

Ala Ala Val Arg Gly Glu Ala Ala Gly Arg Val Arg Leu Cys Arg Gln

290 295 300

His Ser Ala Glu Phe Val Lys His Val Leu Ala Arg His Pro Ile Pro

305 310 315 320

Val Lys Gln Glu Leu Glu Leu Gly Asp Leu Val Ser Arg Thr Gln Gln

325 330 335

Ile Leu Phe Asp Arg Leu Ala Arg Leu Ile Glu Gly Arg Leu Leu Pro

340 345 350

Leu Ala Gly Gly Arg Ile Gly Arg Leu Val Val Glu Arg Val Ala Phe

355 360 365

Asp Ile Leu Ser Gly Pro Leu Lys Ala Arg Arg Ser Leu Ala Glu Glu

370 375 380

Lys Ala Ala Glu Leu Tyr Trp Tyr Gly Pro Gln Ala Gly Phe Ala Asn

385 390 395 400

Arg Leu Ala Met Leu Arg Glu Glu Phe Gly Gly Arg Cys Ala Tyr Cys

405 410 415

Gly Gln Ser Ser Ala Leu Val Glu Val Glu His Ile Leu Pro Arg Ala

420 425 430

Gln Phe Pro Phe Asp Ser Tyr Leu Asn Val Leu Pro Ala Cys Asn Ala

435 440 445

Cys Asn Ala Arg Lys Gly Gly Arg Thr Ala Leu Glu Ala Gln Leu Thr

450 455 460

Val His Asp Ala Ala Tyr Glu Ala Tyr Gly Gln Tyr Leu Ala Gly Arg

465 470 475 480

Arg Val Leu His Pro Tyr His Ser Ile Lys Lys

485 490

<210> 599

<211> 1076

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG102 effectors

<220><223> Description: MG102-19 effector

<400> 599

Met Ser Val Thr Leu Thr Ile Asp Pro Gly Ser Arg Asn Ile Gly Leu
1 5 10 15

Ala Leu Val Arg Ser Arg Ala Gly Asp Arg Pro Ser Ala Leu Tyr Ala
20 25 30

Ala Cys Ile Val Ala Glu Pro Lys Pro Leu Lys Glu Leu Val Val Arg
35 40 45

Arg Ala Gln Leu Arg Arg Met Arg Arg Thr Arg Lys Thr Arg Arg Arg
50 55 60

Arg Leu Arg Arg Leu Ala Asp Ala Leu Arg Gly Ile Ala Gly Ala Glu
65 70 75 80

Ala Ile Val Arg Phe Cys Arg Arg Arg Gly Tyr Ser His Asp Pro Lys
85 90 95

Arg Ala Arg Asp Gly Arg Gly Ala Asp Asp Ser Thr Gly Ala Asp Lys
100 105 110

Leu Leu Phe Asn Val Ser Arg Glu Asp Phe Phe Lys Ala Leu Glu Ala
115 120 125

Glu Val Gln Arg Val Ile Ala Glu Pro Asp Arg Gln Arg Val Leu Ala
130 135 140

Ala Cys Arg Arg His Leu Asn Ala Ala Arg Leu Pro Gly Arg Glu Leu
145 150 155 160

Arg Pro Pro Arg Phe Asp Asn Arg Ala Val Gly Arg Cys Arg Trp Gln
165 170 175

Asp Cys Pro Arg Arg Pro Arg Arg Arg Ala Asn Ala Val Lys Glu Asn
180 185 190

Leu Arg Gln Thr Leu Tyr Glu Trp Leu Lys Pro Val Phe Gly Glu Ala
195 200 205

Leu Ala Gly Leu Glu Gln Ala Glu Ala Ala Lys Ala Lys Ser Lys Met
210 215 220

Cys Ala Glu Leu Asp His Trp Cys Ser Leu Leu Ala Lys Leu Ala Ala

225 230 235 240

Glu Tyr Arg Lys Leu Ala Asp Glu Gln Pro Asp Gln Arg Asp Glu Lys

245 250 255

Ala Ile Lys Lys Val Ser Ala Leu Leu Glu Arg Arg Lys Asn Glu Leu

260 265 270

Tyr Gln Lys Ile Val Asp Trp Ala Gln Glu Asn Ala Pro Ala Lys Ala

275 280 285

Gly Arg Lys Phe Ala Glu Asp Phe Glu Ala Tyr Cys Asp Lys Lys Arg

290 295 300

Ser Lys Gly Lys Gln Lys Trp Glu Gly Val Ser Ala Ala Gly Ala Thr

305 310 315 320

Gln Ala Gly Ala Val Gly Gln Lys Lys Lys Lys Lys Lys Lys Lys Arg

325 330 335

Gly Phe Gly Asn Gln Leu Asp Asp Ile Val Val Lys Gly Arg Ala Gly

340 345 350

Arg Leu Gln Tyr Cys Arg Glu His Thr Glu Gln Tyr Ile Gln Tyr Phe

355 360 365

Leu Glu Gly Lys Pro Ile Pro Asn Arg Glu Asp Val Leu Asp Arg Asp

370 375 380

Ile Arg Ser Arg Arg Gln Lys Ile Val Phe Asp Arg Leu Trp Ala Leu

385 390 395 400

Ile Arg Gly Arg Leu Leu Pro Leu Ala Gly Gly Arg Ile Asp Arg Ile

405 410 415

Val Val Glu Arg Val Ala Phe Asp Val Leu Ala Gly Thr Phe Ala Asp

420 425 430

Cys Gln Glu Leu Phe Arg Thr Asp Glu Glu Lys Ala Ala Glu Met Tyr

435 440 445

Trp Phe Gly Pro Arg His Gly Phe Lys Asn Glu Leu Glu Met Leu Arg

450 455 460

Thr Glu Phe Ala Gly Arg Cys Ala Tyr Cys Gly Gln Gln Phe Gln Asp

465 470 475 480

Leu Glu Val Glu His Ile Leu Pro Arg Ser Arg Phe Pro Phe Asp Ser
485 490 495
Tyr Leu Val Lys Val Pro Ala Cys Arg Gln Cys Asn Met Lys Lys Gly
500 505 510
Gly Arg Ser Ile Leu Glu Ala Gln Met Arg Ile His Pro Asp Ala Tyr
515 520 525
Asp Ala Tyr Glu Gln Tyr Leu Glu Lys Arg Glu Val Arg His Tyr Phe

530 535 540
Cys Asp Ile Lys Lys Gly Val Leu Lys Leu Leu Thr Asn Gly Ala Gln
545 550 555 560
Asn Trp Gly Phe Glu Arg Leu Leu Gly Met Ile Ala His Asn Ile Phe
565 570 575
Glu Gln Gly Lys Ser Gln Asn Ala Pro Arg Ala Leu Gly Arg Trp Leu
580 585 590
Ala Gly Lys Leu Glu Arg Glu Thr Gly Val Arg Pro Lys Val Val Phe

595 600 605
Leu Ser Gly Arg His Thr Ala Ala Trp Arg Gln Gln Val Leu Pro Asp
610 615 620
Tyr Glu Lys Ala Ala Glu Lys Ala Glu Gly Lys Lys Arg Asn His Ala
625 630 635 640
Val Asp Ala Ile Leu Leu Gly Cys Asp Phe Pro Pro Val Ala Phe Leu
645 650 655
Asp Ser Gln Arg Lys Trp Trp Leu Ser Glu Asp Arg Leu Arg Arg Trp

660 665 670
Glu Glu Gln Val Lys Ala Ala Ala Pro Glu Leu Ala Asp Leu Ala Gly
675 680 685
Asp Gly Asp Ala Ala Pro Ala Arg Leu Pro Arg Val Glu Ala Pro Pro
690 695 700
Pro Ile Arg Phe Phe Glu Glu Asp Leu Gly Gly Gly Tyr Phe Lys Ile
705 710 715 720
Asp Leu Ser Ala Phe Gly Trp Asn Arg Arg Arg Gln Ser Gly Ala Lys

725 730 735

Val Asp Pro Val Arg Met Ile Thr Thr Ala Asn Gly Lys Leu Val Ala

740 745 750

Lys Arg Glu Pro Ala Gln Ala Val Leu Lys Asp Leu Leu Ala Glu Lys

755 760 765

Gln Arg Asp Lys Arg Ile Lys Leu Ile Ala Asn Arg Arg Leu Arg Gln

770 775 780

Leu Leu Gln Ser Asp Pro Ala Asn Ala Ala Arg Asn Tyr Val Leu Trp

785 790 795 800

Leu Gln Arg Gln Thr Ala Arg Gly Leu Arg Ala Ala Lys Met Gly Asn

805 810 815

His Pro Ala Asp Thr Lys Arg Arg Glu Met Leu Glu Gln Phe Ile Asn

820 825 830

Thr Pro Val Asp Asp Phe Leu Arg Pro Ser Lys Arg Arg Thr Ala Lys

835 840 845

Lys Ala Gln Gln Gln Thr Gln Ser Ser Asp Gly Arg Gly Asn Gly Gln

850 855 860

Ser Ala Ala Glu Gln Thr Ser Ala Ala Glu Ile Pro Ala Ile Ile Gly

865 870 875 880

Val Cys Cys Leu Ile Ala Gln Lys Tyr Thr Lys Tyr Asp Val Pro Arg

885 890 895

Cys Asp Arg Asn Gly Lys Pro Leu His Tyr Tyr Ala Ser Gln Pro Ala

900 905 910

Ile Arg Ala Leu Tyr Val Gly Tyr Lys Arg Arg Lys Asp Gly Arg Leu

915 920 925

Asp Arg Ser Lys Pro Glu Ile Phe Arg Val Asn Gln Val Trp Lys Val

930 935 940

Tyr Tyr Gly Pro Pro Gly Lys Asp Gln Asp Ser Pro Lys Ala Arg Lys

945 950 955 960

Val Ile Glu Lys Leu Gly Gln Asp Ser Pro Leu His Gly Arg Met Leu

965 970 975

Gly Gln Arg Gly Ser Trp Gln Glu Phe Arg Lys Arg Trp His Glu Ala

980 985 990

Phe Gly Arg Leu Trp Ala Asp Leu Gly Val Glu Lys Arg Phe Gln Ile

995 1000 1005

Ala Gln Gly Ala Val Ile Glu Lys Thr Asp Gly Thr Cys Phe Leu

1010 1015 1020

Val Arg Asn Phe Asp Asn Thr Glu Gly Trp Met Arg Gly Ser Pro

1025 1030 1035

Trp Lys Asp Ile Arg Arg Val Tyr Arg Ser Pro Leu His Tyr Leu

1040 1045 1050

Ser Ala Lys Ala Lys Ala Ala Phe Asp His Ser Ser Arg Ser Ala

1055 1060 1065

Ala Thr Val Ala Glu Thr Ile Asn

1070 1075

<210> 600

<211> 949

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG102 effectors

<220><223> Description: MG102-20 effector

<400> 600

Met Ile Thr Leu Ala Ile Asp Tyr Gly Ala Ser Asn Ile Gly Ile Ala

1 5 10 15

Leu Val Arg Asn Thr Glu Glu Gly Asn Glu Pro Leu Phe Ala Gly Thr

20 25 30

Ile Ile Ile Asp Ala Lys Gly Val Lys Asp Leu Ala Glu Pro Arg Ala

35 40 45

Ala Ile Arg Arg Leu Arg Arg Thr Arg Lys Thr Lys Ile Arg Arg Leu

50 55 60

Arg Gln Leu Ser Leu Ala Leu Lys Arg Leu Gly Leu Gly Glu Glu Val

65 70 75 80

Ser Arg Ile Val Arg Phe Ala Arg Arg Arg Gly Tyr Lys Ser Leu Phe

85 90 95

Asp Asp Pro Asp Glu Ala Lys Gln Thr Lys Asp Asp Val Ser Gly Tyr

100 105 110

Arg Cys Thr Arg Glu Glu Phe Phe His Glu Leu Glu His Glu Leu Gln

115 120 125

Ala Ile Ile Ile Asp Thr Glu Gln Tyr His Arg Ala Leu Ser Val Cys

130 135 140

Glu Arg Val Leu Asn Arg Arg Gly Glu Arg Tyr Gly Glu Ile Arg Pro

145 150 155 160

Leu Lys Ile Asp Asn Arg Gly Arg Ser Arg Cys Ala Trp Glu Gly Cys

165 170 175

Asn Arg Val Thr Pro Arg Arg His Asn Ala Thr Asp Asp Val Val Arg

180 185 190

Gln Gln Leu Val Thr Tyr Phe Gln Ser Pro Leu Arg Arg Glu Pro Gly

195 200 205

Lys Leu Pro Met Leu Glu Gln Ala Val Val Lys Leu Asp Ile Ile Ser

210 215 220

Lys Asn Leu Arg Gly Ser Asn Glu Ala Lys Cys Arg Asn Ala Leu Asn

225 230 235 240

Lys Arg Ala Arg Thr Ile Leu Arg Gly Leu Gln Ala Ala Leu Pro Met

245 250 255

His Glu Asp Glu Gly Gly Ser Asp Lys Glu Ser Trp Glu Tyr Val Glu

260 265 270

Lys Gly Ile Val Lys Ile Leu Glu Asn Ala Gly Gly Arg Asn Arg Tyr

275 280 285

Cys Arg Glu His Ser Lys Ala Tyr Cys Asp Arg Val Leu Glu Gly Lys

290 295 300

Pro Ser Glu Phe Lys Ser Ser Ile Gln Glu Ser Asp Ile Ile Ser Arg

305 310 315 320

Arg Glu Gln Ile Ile Phe Asn Lys Leu Trp Arg Tyr Ile Glu Ala Arg

325 330 335

Leu Leu Pro Leu Ala Pro Glu Gly Ile Asp Arg Ile Val Val Glu Arg

340 345 350

Thr Ala Phe Asp Leu Leu Ala Gly Lys Gln Lys Lys Ile Arg Asp Ala

355 360 365

Ser Ser Lys Ser Val Glu Ser Ile Tyr Gln Tyr Gly Pro Arg Tyr Gly

370 375 380

Phe Thr Ser Glu Lys Glu Met Leu Arg Lys Glu Phe Gly Gly Leu Cys

385 390 395 400

Ala Tyr Cys Gly Lys Pro Ser Glu Thr Leu Leu Glu Arg Glu His Ile

405 410 415

Leu Pro Arg Arg Leu Phe Phe Phe Asp Ser Tyr Leu Asn Ile Leu Pro

420 425 430

Ser Cys Pro Gln Cys Asn Ala Ala Lys Gly Thr Ser Leu Pro Gly Val

435 440 445

Ser Ser Leu Arg Val His Glu Asp Ala Tyr Arg Asn Tyr Glu Ser Tyr

450 455 460

Ile Asn Glu Leu Lys Ser Lys Arg Pro Leu His Phe Leu His Thr Glu

465 470 475 480

Lys Lys Gly Ile Leu Asn Leu Met Arg Asp Pro Glu Arg Ala Trp Asp

485 490 495

Trp Glu Arg Tyr Leu Arg Leu Ile Ala Asn Asn Phe Ala Ser Ile Val

500 505 510

Gln Thr Gln Arg Gly Pro Arg Pro Phe Ala Arg Tyr Leu Tyr Ser Lys

515 520 525

Leu Ser Arg Arg Gln Glu Lys Pro Pro Glu Ile Ala Phe Arg Ser Gly

530 535 540

Arg His Thr Ala Leu Tyr Arg Ser Val Ala Tyr Pro Asp Phe Ser Lys

545 550 555 560

Ala Gln Glu Lys Ala Gly Glu Asp Gly Asn Ser His Pro Val Asn His
565 570 575
Ala Leu Asp Ala Leu Leu Leu Ala Ser Lys Leu Pro Arg Pro Glu Pro

580 585 590
Leu Glu Ala Arg Gly Leu Asn His Ala Ser Leu Lys Ala Trp Ala Asp
595 600 605
Gln Val Arg Gly Lys Ala Ala Pro Ala Gly Glu Asp Gly Ile Pro Val
610 615 620
Ile Pro Ala Tyr Lys Cys Phe Val Pro Gly Phe Glu Glu Thr Asp Ala
625 630 635 640
His Gly Tyr Val Thr Val Glu Met Ala Met Met Asn Trp Asn Lys Lys

645 650 655
Asp Thr Ala Thr Thr Lys Gln Asp Pro Tyr Gly Trp Ser Glu Ser Arg
660 665 670
Gln His Pro Thr Lys Arg Val Ser Ala Arg Thr Leu Phe Asp Asp Leu
675 680 685
Arg Glu Glu Lys Ser Lys Lys Asn Pro Ser Glu Leu Ile Lys Arg Ile
690 695 700
Tyr His Pro Ala Leu Arg Ser Ala Val Glu Lys Ala Tyr Gln Glu Ser

705 710 715 720
His Asn Arg Ile Gln Ala Ala Glu Ala Leu Lys Asn Trp Leu Arg Asp
725 730 735
Ser Val Lys Asn Ser Leu Arg Ser Ser Ser Phe Ser Arg His Pro Ser
740 745 750
Asp Ile Arg Arg Arg Gln Asp Leu Glu Arg Phe Ala Asn Gly Lys Thr
755 760 765
Asp Glu Ile Pro Val Val Ile Gly Ile Lys Cys Leu Asp Thr Gly Val

770 775 780
Ala Gly Lys Ile Asp Ala Ala Arg Met Asp Arg Gln Thr Gly Thr Thr
785 790 795 800
Gly His Arg Tyr Leu Thr Asp Pro Ala Asn Arg Gly Val Val Leu Ala

805 810 815

Tyr Pro Thr Thr Arg Ser Gly Ala Cys Asp Arg Arg Lys Pro Cys Thr

820 825 830

Ala Gly Ile Arg Gln Asn Tyr Ser Leu Lys Thr Asp Glu Thr Ala Phe

835 840 845

Arg Ser Met Pro Ala Ser Leu Glu Arg Gly Val Val Trp Gly Lys Lys

850 855 860

Thr His Ser Pro Arg Ala Met Glu Ser Ala Phe Ser Lys Glu Leu Glu

865 870 875 880

Gln Tyr Leu Arg Asp Arg Arg Phe His Ser Tyr Cys Ile Leu Thr Ala

885 890 895

Gly Cys Val Val Cys Tyr Glu Asp Gly Thr Glu Arg Phe Ile Arg Asn

900 905 910

Phe Asp Lys Ser Lys Gly Phe Lys Lys Thr Ile Leu Arg Asn Ile Val

915 920 925

Ala Leu Lys Arg Thr Pro Leu Ser Thr Arg Val Val Pro Leu Lys Val

930 935 940

Leu Thr Ala Leu Pro

945

<210> 601

<211> 375

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG102 effectors

<220><223> Description: MG102-21 effector

<400> 601

Ser His Gly Leu Ser Ile Cys Phe Lys Glu Ile Arg Leu Leu Arg Ile

1 5 10 15

Glu Asn Arg Gly Arg Ser Arg Cys Ala Trp Asp Gly Cys Ser Lys Val

20 25 30

Thr Pro Arg Arg Asp Asn Gly Leu Arg Glu Ile Leu Ala Gln Glu Ile

35 40 45

Ile Thr Val Tyr Ala Arg Gln Ile Arg Lys Tyr Pro His Leu Tyr Pro

50 55 60

Glu Leu Gln Gln Lys Ile Asp Leu Leu Ala Glu Leu Gly Lys Arg Phe

65 70 75 80

Arg His Ala Ala Gly Pro Asp Val Gln Lys Glu Gln Asp Cys Leu Lys

85 90 95

Lys Arg Ile Ser Ala Glu Leu Thr Ser Leu Lys Ile Leu Leu Asp Ile

100 105 110

Thr Glu Thr Asp Lys Lys Trp Gln Tyr Phe Arg Lys Asn Leu Thr Asp

115 120 125

Ile Ile Lys Lys Ser Asn Gly Arg Asn Arg Phe Cys Arg Trp His Ser

130 135 140

Asp Gln Tyr Val Ala His Leu Leu Glu Gly Lys Pro Ile Pro Phe Lys

145 150 155 160

Arg Ser Leu Ser Glu Ala Asp Ile Thr Ser Arg Arg Glu Glu Ile Leu

165 170 175

Phe Gln Lys Leu Trp Arg Tyr Val Glu Ala Arg Ile Leu Pro Leu Ala

180 185 190

Pro Gln Gly Ile Asp Arg Ile Val Val Glu Arg Thr Ala Phe Asp Leu

195 200 205

Leu Ala Gly Ser Arg Thr Gln Arg Gln Lys Leu Ser Asp Asp Glu Leu

210 215 220

Glu Ser Met Tyr Gln Lys Gly Pro Arg Tyr Gly Phe Asn Ser Asp Leu

225 230 235 240

Glu Met Leu Lys Cys Glu Phe Gly Gly Leu Cys Ala Tyr Cys Gly Gln

245 250 255

Pro Ala Gly Glu Ile Leu Glu Arg Glu His Ile Leu Pro Gln Ala Asp

260 265 270

Phe Phe Phe Asp Ser Tyr Leu Asn Lys Val Pro Ala Cys Pro Glu Cys

275 280 285

Asn Arg Ile Trp Lys Gly Asn Ser Ser Pro Leu Glu Ala Ser Met Val

290 295 300

Ile His Glu Lys Ala Tyr His Ala Tyr Cys Gln Tyr Leu Ser Ala Lys

305 310 315 320

Phe Gly Asn Lys Pro Pro His Val Tyr His Asn Thr Lys Lys Gly Leu

325 330 335

Leu Lys Leu Met Thr Arg Lys Glu Arg Leu Pro Glu Val Gln Arg Leu

340 345 350

Leu Ala Leu Ile Ser Lys Asn Leu Gly Thr Ile Gly Glu Ser Gln Lys

355 360 365

Ser Pro Arg Pro Leu Ala Arg

370 375

<210> 602

<211> 519

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG102 effectors

<220><223> Description: MG102-22 effector

<400> 602

Met Lys Asn Lys Val Thr Ser Gly Arg Thr Tyr Thr Leu Gly Ile Asp

1 5 10 15

Tyr Gly Ala Ser Asn Val Gly Ile Ala Leu Val Cys Asn Glu Ser Thr

20 25 30

Gly Glu Asn Val Pro Leu Phe Ala Ala Thr Leu Arg Leu Asp Ala Arg

35 40 45

Asp Leu Lys Glu Lys Val Glu Thr Arg Ala Gly Ile Arg Ser Leu Arg

50 55 60

Arg Thr Lys Lys Thr Lys Lys Arg Arg Leu Arg Glu Leu Glu Asn Thr

65 70 75 80

Leu Thr Ser Ile Gly Leu Pro Glu Asp Asn Val Ala Ser Ile Ile Arg
85 90 95
Phe Ser Lys Arg Arg Gly Tyr Lys Ser Leu Phe Asp Lys Asp Asp Ser

100 105 110
Glu Glu Thr Ala Glu Gln Pro Asp Ser Glu Phe Val Tyr Arg Phe Ser
115 120 125
Arg Glu Ile Phe Phe Gln Ser Leu Lys Ser Glu Leu Glu Thr Ile Val
130 135 140
Ala Asp Pro Ser Leu Arg Leu Lys Ala Leu Ala Gln Cys Glu Arg Ile
145 150 155 160
Leu Asn Lys Gln Gly Asn Pro Asp His Glu Ile Arg Arg Ile Arg Ile

165 170 175
Asp Asn Arg Gly Ala Ser Arg Cys Ala Trp Glu Asn Cys Asn Arg Val
180 185 190
Thr Pro Arg Ser Asp Asn Ala Ile Lys Asp Val Leu Ala Gln Gln Leu
195 200 205
Tyr Asn Tyr Phe Gln Thr Ala Leu Arg Glu Asn Pro Ser Gly Thr Ala
210 215 220
Lys Val Asp Asp Val Leu Gln Lys Leu Glu Pro Ile Ala Lys Arg Ile

225 230 235 240
Arg Ala Val Ser Gly Asp His Val Lys Glu Glu Lys Lys Ala Leu Arg
245 250 255
Lys Gln Ala Arg Thr Ala Leu Arg Asp Leu Asn Arg Ile Leu Met Pro
260 265 270
Ile Pro Asp Gly Val Pro Asn Asp Glu Ser Trp Glu Tyr Val Glu Lys
275 280 285
Gly Val Met Asn Ser Val Glu Lys Arg Ser Gly Arg Asn Arg Tyr Cys

290 295 300
Arg Glu His Ser Val Glu Tyr Ile Arg Thr Ile Leu Ala Gly Lys Ala
305 310 315 320
Val Pro Phe Lys Lys Thr Ile Thr Asp Ala Asp Ile Ile Ser Arg Arg

325 330 335

Glu Gln Ile Ala Tyr Ser Lys Leu Trp Arg Tyr Ile Glu Ala Arg Val

340 345 350

Leu Pro Leu Thr Pro Gln Gly Ile Asp Arg Ile Val Val Glu Arg Thr

355 360 365

Ala Phe Asp Leu Leu Ala Gly Ser Trp Lys Thr Ile Gln Gly Ala Ser

370 375 380

Asp Lys Phe Lys Glu Asp Met Tyr Gln Gln Gly Pro Met Phe Gly Phe

385 390 395 400

Ser Ser Arg Ala Glu Met Leu Lys Glu Glu Phe Gly Gly Leu Cys Ala

405 410 415

Tyr Cys Gly Lys Pro Ser Ala Val Leu Met Asp His Asp His Ile Leu

420 425 430

Pro Arg Ala Asp Phe Phe Phe Asp Gly Tyr Leu Asn Ile Leu Pro Ala

435 440 445

Cys Pro Thr Cys Asn Ser Asn Leu Lys Gly Lys Arg Ala Ala Ser Asp

450 455 460

Gln Ala Leu Thr Val Ala Pro Asn Ala Tyr Glu Ala Tyr Lys Asn Tyr

465 470 475 480

Leu Ala Lys Lys Phe Arg Asn Arg Pro Met His Phe Trp His Thr Val

485 490 495

Lys Lys Gly Ile Leu Asn Phe Met Lys Asp Arg Asn Arg Phe Gly Glu

500 505 510

Ala Glu Asn Ile Ser Thr Val

515

<210> 603

<211> 363

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG102 effectors

<220><223> Description: MG102-23 effector

<400> 603

Leu Leu Ala Ser Glu Leu Pro Asp Leu Tyr Pro Val Glu Ala Leu Asn

1 5 10 15

Leu Pro Leu Trp Gln Leu Lys Asn Trp Ala Asp Thr Val Arg Ala Arg

20 25 30

Ala Pro Lys Ser Gly Asp Glu Gly Val Pro Ile Cys Pro Asp Gly Pro

35 40 45

Gln Tyr Val Asp Gly Phe Glu Thr Val His Pro Gly Gly Tyr Val Glu

50 55 60

Val Asp Leu Arg Ser Met Arg Trp Asn Gln Lys Asp Ser Met Thr His

65 70 75 80

Lys Gln Asp Pro Tyr Gly Phe Ser Glu Lys Thr Gly Met Pro Thr Lys

85 90 95

Arg Gly Ser Ala Phe Asp Leu Tyr Thr Lys Leu Lys Lys Glu Lys Asn

100 105 110

Pro Ser Lys Val Lys Ser Arg Ile Ala Leu Ile His His Pro Ala Leu

115 120 125

Arg Lys Ala Leu Ser Glu Ser Leu Gln Ser Asp Thr Thr Gly Ser Ser

130 135 140

Ala Ala Glu Asn Leu Lys Thr Trp Leu Arg Ile Ser Val Lys Asn Ser

145 150 155 160

Leu Ala His Ser Arg Phe Ser Asn His Pro Gly Asp Gln Ala Arg Arg

165 170 175

Ser Glu Leu Glu Lys Phe Ile Thr Gln Glu Asp Cys Pro Ile Pro Ser

180 185 190

Val Ile Gly Val Lys Met Phe Asp Met Gly Val Arg Gly Lys Ile Asp

195 200 205

Met Lys Arg Leu Asp Arg Gln Thr Gly Gly Ile Gly His Arg Tyr Met

210 215 220

Thr Gln Pro Pro Asn Lys Gly Val Ile Val Ala Tyr Pro Lys Arg Glu

225 230 235 240

Asp Gly Lys Pro Asp Leu Thr Lys Pro Cys Cys Val Tyr His Lys Gln

245 250 255

Asp Leu Ser Met Thr Pro Glu Asn Ile Ser Ile Phe Lys Pro Pro Pro

260 265 270

Pro Ile Leu Ser Asp Gly Val Ile Leu Gly Lys Lys Pro Tyr Asp Lys

275 280 285

Gly Asp Arg Arg Lys Ala Leu Glu Lys Tyr Leu Ser Asp Cys Gly Phe

290 295 300

His Ser Tyr Val Tyr Leu Thr Pro Gly Cys Thr Ile Arg Tyr Lys Asp

305 310 315 320

Gly Asn Glu Trp Phe Val Arg Asn Phe Asp Ser Ser Glu Asp Phe Lys

325 330 335

Lys Gly Arg Leu Arg Glu Ile Ile Gly Thr Arg Arg Thr Pro Phe Val

340 345 350

Asp Ser Leu Ile Pro Leu Lys Val Leu Ser Gln

355 360

<210> 604

<211> 336

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG102 effectors

<220><223> Description: MG102-24 effector

<400> 604

Ala Asp Asp Asp His Asp Glu Ala Glu Leu Thr Tyr Arg Phe Thr Arg

1 5 10 15

Glu Glu Phe Phe Lys Ala Leu Gly Thr Glu Leu Gln Ser Ile Ile Pro

20 25 30

Asp Thr Ser Gln Arg Gln Lys Ala Leu Ser Thr Cys Glu Thr Ile Leu

35 40 45

Asn Arg Gln Gly Asp Arg Ser Leu Glu Ile Arg Gln Ile Lys Ile Asp

50 55 60

Asn Arg Gly Ala Ser Arg Cys Ala Trp Glu Gly Cys Asn Arg Val Thr

65 70 75 80

Pro Arg Ser Asp Asn Ala Leu Gly Glu Val Leu Ser Gln Gln Ile Tyr

85 90 95

Thr Val Phe Gln Ser Ala Leu Lys Val Asn Pro Val Leu Cys Gln Lys

100 105 110

Val Glu Thr Ala Thr His Glu Leu His Glu Leu Ala Lys Arg Leu Arg

115 120 125

Asn Ala Ser Gly Glu Ala Ala Ser Asn Glu Lys Lys Ile Leu Arg Lys

130 135 140

Arg Ala Arg Thr Ile Leu Arg Ala Leu Lys Glu Leu Leu Tyr Thr Pro

145 150 155 160

Ala Glu Gly Val Gly Asp Ala Glu Lys Ala Trp Lys Tyr Ile Glu Thr

165 170 175

Gly Ile Met Asn Ile Met Glu Ser Arg Leu Gly Arg Asn Arg Tyr Cys

180 185 190

Arg Glu His Ser Arg Glu Tyr Val Gln Thr Ile Cys Ser Gly Lys Leu

195 200 205

Val Pro Phe Lys Gln Thr Ile Ser Glu Ser Asp Ile Ile Ser Arg Arg

210 215 220

Glu Gln Ile Ala Tyr Ala Lys Leu Trp Arg Tyr Ile Glu Ala Arg Ile

225 230 235 240

Leu Pro Leu Thr Pro Gly Gly Ile Asp Arg Ile Val Val Glu Arg Thr

245 250 255

Ala Phe Asp Leu Leu Ala Gly Ser Arg Lys Thr Ile Gln Lys Ala Thr

260 265 270

Asp Gln Phe Lys Glu Glu Met Tyr Gln His Gly Pro Met Tyr Gly Phe

275 280 285

Glu Ser Val Pro Asp Met Leu Lys Glu Glu Phe Gly Gly Leu Cys Ala

290 295 300

Tyr Cys Gly Gln Ser Ser Ser Thr Leu Ile Asp Val Asp His Ile Leu

305 310 315 320

Pro His Ala Asp Phe Leu Phe Asp Ser Tyr Leu Asn Ile Leu Pro Ala

325 330 335

<210> 605

<211> 553

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG102 effectors

<220><223> Description: MG102-25 effector

<400> 605

Ile Asp Asn Arg Gly Ala Ser Arg Cys Ala Trp Glu Asn Cys Asn Arg

1 5 10 15

Val Thr Pro Arg Ser Asp Asn Ala Ile Lys Asp Val Leu Ala Gln Gln

20 25 30

Leu Tyr Asn Tyr Phe Gln Thr Ala Leu Arg Glu Asn Pro Ser Gly Thr

35 40 45

Ala Lys Val Asp Asp Val Leu Gln Lys Leu Glu Pro Ile Ala Lys Arg

50 55 60

Ile Arg Ala Val Ser Gly Asp His Val Lys Glu Glu Lys Lys Ala Leu

65 70 75 80

Arg Lys Gln Ala Arg Thr Ala Leu Arg Asp Leu Asn Arg Ile Leu Met

85 90 95

Pro Ile Pro Asp Gly Val Pro Asn Asp Glu Ser Trp Glu Tyr Val Glu

100 105 110

Lys Gly Val Met Asn Ser Val Glu Lys Arg Ser Gly Arg Asn Arg Tyr

115 120 125

Cys Arg Glu His Ser Val Glu Tyr Ile Arg Thr Ile Leu Ala Gly Lys

130 135 140

Ala Val Pro Phe Lys Lys Thr Ile Thr Asp Ala Asp Ile Ile Ser Arg
145 150 155 160

Arg Glu Gln Ile Ala Tyr Ser Lys Leu Trp Arg Tyr Ile Glu Ala Arg
165 170 175
Val Leu Pro Leu Thr Pro Gln Gly Ile Asp Arg Ile Val Val Glu Arg
180 185 190
Thr Ala Phe Asp Leu Leu Ala Gly Ser Trp Lys Thr Ile Gln Gly Ala
195 200 205
Ser Asp Lys Phe Lys Glu Asp Met Tyr Gln Gln Gly Pro Met Phe Gly
210 215 220

Phe Ser Ser Arg Ala Glu Met Leu Lys Glu Glu Phe Gly Gly Leu Cys
225 230 235 240
Ala Tyr Cys Gly Lys Pro Ser Ala Val Leu Met Asp His Asp His Ile
245 250 255
Leu Pro Arg Ala Asp Phe Phe Phe Asp Gly Tyr Leu Asn Ile Leu Pro
260 265 270
Ala Cys Pro Thr Cys Asn Ser Asn Leu Lys Gly Lys Arg Ala Ala Ser
275 280 285

Asp Gln Ala Leu Thr Val Ala Pro Asn Ala Tyr Glu Ala Tyr Lys Asn
290 295 300
Tyr Leu Ala Lys Lys Phe Arg Asn Arg Pro Met His Phe Leu His Thr
305 310 315 320
Val Lys Lys Gly Ile Leu Asn Leu Met Lys Asp Pro Asp Arg Ile Trp
325 330 335
Glu Ala Glu Lys Tyr Leu Ser Ile Val Ala Arg Gln Tyr Ala Gln Ile
340 345 350

Val Gln Thr Gln Arg Ser Pro Arg Pro Phe Ala Arg Leu Leu Tyr Arg
355 360 365
Lys Ile Arg Glu Thr Gln Gly Ser Glu Pro Asp Ile Thr Phe Arg Ser
370 375 380
Gly Arg His Thr Ala Leu Tyr Arg Thr Ile Ala Tyr Pro Glu Phe Gln

385 390 395 400

Lys Tyr Ala Asp Lys Glu Glu Gly Asn Val Ile Asn His Gly Leu Asp

405 410 415

Ala Ile Ile Leu Ala Ser Ser Leu Pro Asp Leu Tyr Pro Val Glu Ser

420 425 430

Leu Asn Ile Pro Met Glu Ser Leu Lys Gly Trp Thr Val Ala Val Arg

435 440 445

Lys Arg Ala Pro Leu Pro Gly Pro Asp Gly Ile Pro Ser Ile Ala Val

450 455 460

Ser His Thr Val Glu Gly Phe Glu Lys Ile His Gly Pro Gly Tyr Ile

465 470 475 480

Glu Met Glu Val Arg Ala Met Val Trp Asn Lys Lys Asn Ser Met Thr

485 490 495

His Lys Gln Asp Pro Tyr Gly Trp Ser Glu Ala Leu Arg Met Pro Thr

500 505 510

Lys Arg Arg Ala Ala Ala Asp Leu Tyr Ala Asp Met Met Lys Glu Thr

515 520 525

Ser Leu Thr Lys Leu Lys Gly Ile Val Glu Arg Phe Tyr His Pro Ser

530 535 540

Leu Lys His Tyr Val Leu Gly Lys Arg

545 550

<210> 606

<211> 328

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG102 effectors

<220><223> Description: MG102-27 effector

<400> 606

Met Gly Thr Ala Thr His Thr Leu Gly Ile Asp Phe Gly Ser Gln Asn

1 5 10 15

Ile Gly Ile Ala Leu Val Arg His Ser Asn Ser His Pro Asn Glu Val
20 25 30

Leu Tyr Ala Gly Thr Leu Phe Val Asn Ser Arg Leu Leu Ser Ser Arg
35 40 45
Val Asp Asp Arg Lys Ala Ala Arg Arg Thr Arg Arg Thr Gln Lys Thr
50 55 60
Lys Lys Arg Arg Met Arg Asn Leu Lys Gln Thr Leu Lys Ser Leu Gly
65 70 75 80
Ile Glu Gly Asp Thr Ala Lys Ser Ile Val Ser Phe Ser Arg Arg Arg
85 90 95

Gly Tyr Ser Trp Thr Arg Asp Asp Ile Ala Leu Glu Gly Glu Gln Ala
100 105 110
Glu Lys Glu Tyr Phe Asp Phe Ser Ile Ser Arg Glu Glu Phe Phe Ser
115 120 125
Ala Leu Lys Lys Glu Ile Glu Arg Ile Leu Pro Glu Asp Arg Gln Arg
130 135 140
Glu Val Phe Asn Cys Cys Arg Asn Val Leu Asp Arg Glu Ile Arg Pro
145 150 155 160

Ser Arg Phe Met Asn Arg Asn Pro Ser Lys Cys Trp Trp Glu Gly Cys
165 170 175
Asn Arg Asn Leu Pro Ser Ala Arg Asn Ala Val Glu Leu Arg Leu Lys
180 185 190
Gln Ser Leu Phe Ile Lys Phe Leu Pro Leu Ile Asp Leu Leu His Glu
195 200 205
Asp Lys Thr Lys His Asp Glu Phe Ile Asp Ser Leu Asn Ala Phe Ile
210 215 220

Ala Leu Phe Arg Glu Leu Ser Asp Arg Phe Arg Lys Ala Arg Leu Val
225 230 235 240
Glu Asn Glu Glu Leu Arg Asp Ser Glu Thr Lys Thr Leu Arg Glu Glu
245 250 255
Tyr Arg Lys Lys Lys Ala Asp Phe Lys Lys Tyr Leu Leu Ser Val Ala

260 265 270

Lys Ser Leu Gly Lys Glu His Leu Asp Asn Ile Lys Thr Asn Phe Asn

275 280 285

Thr Tyr Tyr Gly Lys Glu Ile Asp Asn Val Val Lys Lys Val Gln Ser

290 295 300

Gly Arg Val Ser Phe Cys Arg Glu His Ser Asp Ala Tyr Val Gln Tyr

305 310 315 320

Met Leu Glu His Arg Glu Ile Pro

325

<210> 607

<211> 538

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG102 effectors

<220><223> Description: MG102-28 effector

<400> 607

Met His Glu Asp Lys Thr Lys His Asp Glu Phe Ile Asp Ser Leu Asn

1 5 10 15

Ala Phe Ile Ala Leu Phe Arg Glu Leu Ser Asp Arg Phe Arg Lys Thr

20 25 30

Gln Leu Phe Glu Asn Glu Glu Met Arg Met Asn Glu Thr Lys Thr Leu

35 40 45

Lys Glu Glu Tyr Arg Lys Lys Lys Ala Asp Phe Lys Lys Tyr Leu Leu

50 55 60

Ser Val Ala Lys Ser Leu Gly Lys Glu His Leu Asp Asn Ile Arg Thr

65 70 75 80

Asn Phe Asn Ala Tyr Tyr Gly Lys Glu Ile Asp Asn Val Val Lys Lys

85 90 95

Val Gln Ser Gly Arg Val Ser Phe Cys Arg Glu His Ser Asp Ala Tyr

100 105 110

Val Gln His Met Leu Glu His Arg Glu Ile Pro Tyr Arg Gln Thr Ile
115 120 125

Ser Asp Arg Gln Ile Ile Ser Lys Gln Lys Gln Ile Leu Phe Asn Lys
130 135 140
Ile Trp Arg Phe Ile Glu Ala Arg Leu Leu Ser Leu Ala Glu Gly Lys
145 150 155 160
Ile Asp Thr Val Thr Val Glu Arg Ser Ala Phe Asp Leu Leu Ala Ile
165 170 175
Pro Phe Ser Asp Lys Thr Thr Leu Ser Glu Lys Lys Thr Asp Ala Leu
180 185 190

Tyr Trp Tyr Gly Pro Arg Tyr Gly Tyr Lys Ser Arg Val Glu Met Leu
195 200 205
Tyr Asn Glu Phe Asp Gly His Cys Thr Tyr Cys Gly Gly Lys Phe Asn
210 215 220
Thr Asp Glu Leu Asn Glu Val Glu His Ile Leu Pro Arg Ser Arg Phe
225 230 235 240
Asn Phe Asp Asn Tyr Phe Asn Leu Thr Leu Ser Cys Arg Asp Cys Asn
245 250 255

Arg Lys Lys Gly Asp Arg Thr Ala Tyr Glu Ser Gly Leu Thr Ile His
260 265 270
Glu Thr Ala Tyr Asn Ala Tyr Ser Glu Tyr Val Lys Lys Arg Gly Lys
275 280 285
Phe Arg His Ser Tyr His Asn Leu Lys Lys Gly Ile Leu Asn Leu Met
290 295 300
Arg Arg Lys Asp Ser Asn Ala Glu Thr Val Leu Ser Ile Ile Gly Gln
305 310 315 320

Asn Leu Leu Glu Ile Ala Tyr Thr Gln Arg Gly Pro Arg Pro Leu Ala
325 330 335
Arg Tyr Leu Thr Arg Lys Leu Asn Glu Arg Ser Gln Asn Asn Pro Ala
340 345 350
Ile Lys Tyr Val Ala Gly Arg His Thr Ala Val Tyr Arg Gln Leu Leu

355 360 365

Phe Pro Asp Phe Asp Lys Leu Thr Asp Lys Leu Leu Glu Glu Lys Glu

370 375 380

Asp Ser Val Asn His Ala Leu Asp Ala Cys Ile Leu Ala Phe Trp Met

385 390 395 400

Pro Ala Val Thr Glu Leu Glu Arg Gly Arg Tyr Ala Tyr Arg Asp Val

405 410 415

Thr Tyr Trp Ala Asp Arg Val Arg Ser Leu Ala Ser Lys Thr Asp Asp

420 425 430

Thr Gly Leu Pro Ala Phe Thr Pro Pro Gln Ala Val Gln Asp Phe Glu

435 440 445

Thr Gln Ser Lys Ile Ala Pro Ser Phe Tyr Thr Val Asp Leu Met Ser

450 455 460

Thr Ala Trp Asn Lys Lys Asp Thr Ala Thr Ile Lys Gln Asn Pro Tyr

465 470 475 480

Gly Met Thr Asn Lys Gly Met Pro Ile Lys Lys Lys Ser Gly Ala Thr

485 490 495

Val Leu Gln Glu Ile Leu Glu Arg Lys Asp Arg Glu Asn Leu Thr Asn

500 505 510

Tyr Ile Asn Met Ile Ser His Arg Val Leu Arg Glu Phe Leu Leu Lys

515 520 525

Ala Ile Asn Thr Ala Ser Asp Glu Asn Ile

530 535

<210> 608

<211> 376

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG102 effectors

<220><223> Description: MG102-29 effector

<400> 608

Met Gln Ser Arg Val Thr Leu Ser Ile Asp Phe Gly Tyr Lys Asn Ile
1 5 10 15

Gly Val Ala Leu Val Arg Asp Gln Asp Gly Ile Asn Thr Pro Leu Phe
20 25 30
Ala Gly Thr Leu Leu Tyr Asp Pro Phe Gln Leu Ser Thr Lys Val Gly
35 40 45
Pro Arg Ala Glu Leu Arg Arg Gly Arg Arg Thr Arg Lys Thr Lys Lys
50 55 60
His Arg Leu Asn Leu Leu Lys Lys Lys Leu Phe Asp Thr Asn Leu Pro
65 70 75 80

Glu Gly Ala Val Gln Glu Leu Ile Thr Phe Cys Arg Arg Arg Gly Tyr
85 90 95
Ser Ser Leu Phe Asp Val Lys Glu Pro Pro Lys Thr Gly Lys Val Asp
100 105 110
Ser Lys Glu Glu Ile Val Phe Arg Phe Thr Arg Glu Glu Phe Phe Gly
115 120 125
Ala Leu Glu Lys Gln Ile Glu Arg Leu Val Pro Asp Glu Lys Arg Gly
130 135 140

Leu Val Leu Gly Leu Cys Glu Asn Ile Leu Asn Arg Ala Gly Glu Pro
145 150 155 160
Ser Lys Glu Ile Arg Pro Leu Arg Ile Asn Asn Arg Gly Ala Ser Arg
165 170 175
Cys Ala Trp Asp Gly Cys Glu Asn Val Thr Pro Arg Arg Asp Asn Ala
180 185 190
Leu Arg Asp Pro Leu Ser Gln Phe Val His Thr Val Phe Ala Ala Ser
195 200 205

Leu Arg Gly Asp Thr Ala Leu Gln Gln Glu Val Ala Arg Met Leu Asp
210 215 220
Arg Ile Ala Val Leu Gly Lys Arg Leu Arg His Arg Lys Gly Pro Asp
225 230 235 240
Pro Asp Lys Glu Arg Lys Ala Leu Lys Ala Lys Ile Ser Asp Glu Leu

245 250 255

Lys Leu Leu Lys Lys Leu Tyr Gly Leu Asn Pro Asp Leu Thr Glu Glu

260 265 270

Ala Ala Thr Pro Trp Ala Lys Ile Arg Gln Asn Ile Thr Asn Leu Ile

275 280 285

Glu Gln Thr Gly Gly Arg Asn Arg Phe Cys Arg Tyr His Ser Ser Gln

290 295 300

Tyr Val Thr His Phe Met Glu Gly Lys Pro Ile Pro Phe Lys Ala Thr

305 310 315 320

Leu Thr Glu Lys Asp Leu Val Ser Arg Arg Glu Glu Ile Leu Phe Gln

325 330 335

Lys Ile Trp Arg Tyr Ile Glu Ala Arg Ile Leu Pro Leu Val Pro Asp

340 345 350

Gly Ile Asp Arg Val Ile Val Glu Arg Thr Ala Ile Asp Leu Leu Gly

355 360 365

Gly Ser Arg Lys Gln Arg Gln Gly

370 375

<210> 609

<211> 563

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG102 effectors

<220><223> Description: MG102-30 effector

<400> 609

Glu Thr Lys Thr Leu Arg Glu Glu Tyr Arg Lys Lys Lys Ala Asp Phe

1 5 10 15

Lys Lys Tyr Leu Leu Ser Val Ala Lys Ser Leu Gly Lys Glu His Leu

20 25 30

Asp Asn Ile Arg Thr Asn Phe Asn Ala Tyr Tyr Gly Lys Glu Ile Asp

35 40 45

Asn Val Val Lys Lys Val Gln Ser Gly Arg Val Ser Phe Cys Arg Glu
50 55 60

His Ser Asp Ala Tyr Val Gln His Met Leu Glu His Lys Glu Ile Pro
65 70 75 80
Tyr Arg Gln Thr Ile Ser Asp Arg Gln Ile Ile Ser Lys Gln Lys Gln
85 90 95
Ile Leu Phe Asn Lys Ile Trp Arg Phe Ile Glu Ala Arg Leu Leu Pro
100 105 110
Leu Ala Glu Gly Lys Ile Asp Thr Val Thr Val Glu Arg Ser Ala Phe
115 120 125

Asp Leu Leu Ala Ile Pro Phe Arg Asp Lys Thr Thr Leu Ser Glu Lys
130 135 140
Lys Thr Asp Ala Leu Tyr Trp Tyr Gly Pro Arg Phe Gly Tyr Lys Ser
145 150 155 160
Arg Val Glu Met Leu Tyr Asn Glu Phe Asp Gly His Cys Thr Tyr Cys
165 170 175
Gly Arg Lys Phe Asn Thr Asp Glu Leu Asn Glu Val Glu His Ile Leu
180 185 190

Pro Arg Ser Arg Phe Asn Phe Asp Asn Tyr Phe Asn Leu Thr Leu Ser
195 200 205
Cys Arg Asp Cys Asn Lys Lys Lys Gly Glu Arg Thr Ala Tyr Glu Ser
210 215 220
Gly Leu Thr Ile His Glu Thr Ala Tyr Asn Ala Tyr Ser Glu Tyr Val
225 230 235 240
Lys Lys Arg Gly Lys Phe Arg His Ser Tyr His Asn Leu Lys Lys Gly
245 250 255

Ile Leu Asn Leu Met Arg Arg Lys Asp Ser Asp Ala Glu Thr Val Leu
260 265 270
Ser Ile Ile Gly Gln Asn Leu Leu Glu Ile Ala Tyr Thr Met Arg Gly
275 280 285
Pro Arg Pro Leu Ala Arg Tyr Leu Ala Arg Lys Leu Asn Glu Arg Ser

290 295 300

Gln Asn Asn Pro Ala Ile Lys Tyr Val Ala Gly Arg His Thr Ala Val
305 310 315 320

Tyr Arg Gln Leu Leu Phe Pro Asp Phe Asp Lys Leu Thr Asp Lys Leu
325 330 335

Leu Glu Glu Lys Glu Asp Ser Val Asn His Ala Leu Asp Ala Cys Ile
340 345 350

Leu Ala Phe Trp Met Pro Ala Val Thr Glu Leu Glu Arg Gly Arg Tyr
355 360 365

Ala Tyr Arg Asp Val Thr Tyr Trp Ala Asp Arg Val Arg Ser Leu Ala
370 375 380

Thr Lys Thr Asp Asn Thr Gly Leu Pro Ala Phe Thr Pro Pro Gln Ala
385 390 395 400

Ile Gln Asn Phe Glu Thr Gln Ser Asn Ile Ala Pro Ser Phe Tyr Thr
405 410 415

Val Asp Leu Met Ser Thr Ala Trp Asn Lys Lys Asp Thr Ala Thr Ile
420 425 430

Lys Gln Asn Pro Tyr Gly Met Thr Lys Glu Gly Met Pro Ile Lys Lys
435 440 445

Lys Ser Gly Ala Thr Val Leu Gln Glu Ile Leu Glu Arg Lys Asp Arg
450 455 460

Glu Asn Leu Lys Asn Tyr Ile Asn Thr Met Ser His Arg Val Leu Arg
465 470 475 480

Glu Phe Leu Leu Lys Ala Ile Asn Thr Ala Ser Asp Glu Asn Ile His
485 490 495

Ile Thr Ala Ala Gln Gly Leu Val Glu Trp Leu Arg Lys Ser Val Glu
500 505 510

Gly Ser Ile Arg Asn Asn Arg Phe Ser Leu His Pro Ser Ser Gln Ala
515 520 525

Lys Arg Lys His Leu Glu Asp Phe Ile His Ala Asp Ile Ser Ala Val
530 535 540

Met Asn Thr Pro Glu Lys Tyr Ile Pro Pro Asn Ile Ser Ile Arg Met
545 550 555 560
Leu Asp Leu

<210> 610
<211> 341
<212> PRT
<213> Unknown
<220><223> Description of Unknown:

uncultivated organism
<220><223> Category: MG102 effectors
<220><223> Description: MG102-31 effector
<400> 610
Phe Leu Asn Arg Ala Gly Asn Pro Ser Lys Glu Ile Arg Val Leu Arg
1 5 10 15
Ile Asn Asn Arg Gly Ala Ser Arg Cys Ala Trp Asp Gly Cys Glu Asn
20 25 30
Val Thr Pro Arg Arg Asp Asn Ala Leu Arg Asp Pro Leu Ser Gln Phe
35 40 45

Val His Thr Val Phe Ala Ala Ser Leu Arg Ser Asp Ala Ala Leu Gln
50 55 60
Gln Glu Val Ala Arg Met Leu Asp Arg Ile Ala Glu Leu Gly Lys Arg
65 70 75 80
Leu Arg His Arg Gly Gly Pro Asn Pro Asp Lys Glu Arg Lys Ala Leu
85 90 95
Lys Ala Arg Ile Ser Glu Glu Leu Lys Leu Leu Lys Lys Leu Tyr Gly
100 105 110

Leu Ser Pro Asp Leu Thr Glu Glu Asp Ala Thr Pro Trp Ala Arg Ile
115 120 125
Arg Arg Asn Ile Thr Asn Leu Ile Glu Gln Thr Gly Gly Arg Asn Arg
130 135 140
Phe Cys Arg Tyr His Ser Asn Gln Tyr Val Thr Tyr Phe Met Glu Gly

145 150 155 160

Lys Pro Ile Pro Phe Lys Ala Thr Leu Ser Glu Arg Asp Leu Val Ser

165 170 175

Arg Arg Glu Glu Ile Leu Phe Gln Lys Ile Trp Arg Tyr Ile Glu Ala

180 185 190

Arg Leu Leu Asn Leu Ala Pro Asp Gly Ile Asp Arg Val Ile Val Glu

195 200 205

Arg Thr Ala Ile Asp Leu Leu Gly Gly Ser Arg Lys Gln Arg Gln Gly

210 215 220

Ile Met Asn Lys Glu Ala Leu Glu Glu Met Tyr Gln Tyr Gly Pro Arg

225 230 235 240

Tyr Gly Phe Asn Asp Asp Leu Glu Met Leu Arg Ala Glu Phe Asp Gly

245 250 255

Leu Cys Val Tyr Cys Gly Lys Pro Asn Thr Glu Leu Leu Glu Arg Asp

260 265 270

His Leu Leu Pro Gln Ser Lys Phe Phe Phe Asp Ser Tyr Leu Asn Lys

275 280 285

Val Pro Ala Cys Pro Pro Cys Asn Arg Thr Leu Lys Gln Ala Ala Ser

290 295 300

Pro Gly Gly Ala Ala Leu Arg Ile Asp Glu Arg Ala Tyr Asp Ala His

305 310 315 320

Ser Lys Tyr Val Ala Ser Lys Phe Lys Glu Lys Pro Pro His Leu Phe

325 330 335

His Thr Ile Lys Lys

340

<210> 611

<211> 954

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG102 effectors

<220><223> Description: MG102-32 effector

<

400> 611

Met Gln Ser Arg Val Thr Leu Ser Ile Asp Phe Gly Tyr Lys Asn Ile
1 5 10 15
Gly Val Ala Leu Val Arg Asp Gln Asp Gly Ile Asn Thr Pro Leu Phe
20 25 30
Ala Gly Thr Leu Leu Tyr Asp Pro Phe Gln Leu Ser Thr Lys Val Gly
35 40 45
Pro Arg Ala Glu Leu Arg Arg Gly Arg Arg Thr Arg Lys Thr Lys Lys
50 55 60

His Arg Leu Asn Leu Leu Lys Lys Lys Leu Phe Asp Thr Asn Leu Pro
65 70 75 80
Glu Gly Ala Val Gln Glu Leu Ile Thr Phe Cys Arg Arg Arg Gly Tyr
85 90 95
Ser Ser Leu Phe Asp Val Lys Glu Pro Pro Lys Thr Gly Lys Val Asp
100 105 110
Ser Lys Glu Glu Ile Val Phe Arg Phe Ser Arg Glu Glu Phe Phe Glu
115 120 125

Ala Leu Glu Lys Gln Ile Asp Arg Leu Val Pro Asp Asp Lys Lys Glu
130 135 140
Lys Ala Leu Thr Leu Cys Glu Ala Ile Leu Asn Arg Ala Gly Glu Pro
145 150 155 160
Ser Arg Glu Ile Arg Pro Leu Arg Ile Asn Asn Arg Gly Ala Ser Arg
165 170 175
Cys Ala Trp Asp Gly Cys Glu Asn Val Thr Pro Arg Arg Asp Asn Ala
180 185 190

Leu Arg Asp Pro Leu Ser Gln Phe Val His Thr Val Phe Ala Ala Ser
195 200 205
Leu Arg Gly Asp Ala Thr Leu Gln Asp Glu Val Ala Arg Met Leu Asp
210 215 220
Arg Ile Ala Glu Leu Gly Lys Arg Leu Arg His Arg Gly Gly Thr Asn

225 230 235 240

Pro Asp Lys Glu Arg Lys Ala Leu Lys Ala Glu Ile Ser Glu Glu Leu

245 250 255

Lys Leu Leu Lys Lys Leu Tyr Gly Leu Ser Pro Asp Leu Thr Glu Glu

260 265 270

Ala Ala Thr Pro Trp Ala Lys Ile Arg Gln Asn Ile Thr Asn Leu Ile

275 280 285

Glu Gln Thr Gly Gly Arg Asn Arg Phe Cys Arg Tyr His Ser Ser Gln

290 295 300

Tyr Val Thr His Phe Met Glu Gly Lys Pro Leu Pro Phe Lys Ala Thr

305 310 315 320

Leu Thr Glu Arg Asp Leu Val Ser Arg Arg Glu Glu Ile Leu Phe Gln

325 330 335

Lys Met Trp Arg Tyr Ile Glu Ala Arg Ile Leu Pro Leu Val Pro Asp

340 345 350

Gly Ile Asp Arg Val Ile Val Glu Arg Thr Ala Ile Asp Leu Leu Gly

355 360 365

Gly Ser Arg Lys Gln Arg Gln Gly Ile Ile Asn Lys Glu Ala Leu Glu

370 375 380

Glu Met Tyr Gln His Gly Pro Arg Tyr Gly Phe Ser Asp Asp Leu Glu

385 390 395 400

Met Leu Arg Ala Glu Phe Asp Gly Leu Cys Val Tyr Cys Gly Arg Pro

405 410 415

Asn Ala Glu Leu Val Glu Arg Asp His Leu Leu Pro Gln Ser Lys Phe

420 425 430

Phe Phe Asp Ser Tyr Leu Asn Ile Val Pro Ala Cys Pro Pro Cys Asn

435 440 445

Arg Thr Leu Lys Gln Ala Ala Ser Pro Gly Gly Ala Ser Leu Arg Ile

450 455 460

His Glu Gln Ala Tyr Asp Ala Tyr Ser Lys Phe Met Ala Ser Lys Phe

465 470 475 480

Thr Asn Lys Pro Pro His Leu Phe His Thr Ile Lys Lys Gly Val Leu
485 490 495
Asn Leu Met Arg Glu Pro Gly Arg Val Trp Glu Ala Glu Gln Tyr Leu
500 505 510

Asn Leu Ile Ala Asn Gln Phe Ala Gln Val Val Gly Thr Gln Arg Gly
515 520 525
Pro Arg Pro Leu Ala Arg Tyr Leu Ser Gly Lys Ile Tyr Lys Arg Phe
530 535 540
Gly Glu Lys Pro Gln Ile Gly Phe Ile Asn Gly Arg His Thr Ala Leu
545 550 555 560
Trp Arg Lys Ala Ala Tyr Pro Glu Phe Asp Lys Phe Arg Glu Lys Lys
565 570 575

Glu Gly Gly Val Ile Asn His Ala Leu Asp Ala Leu Leu Met Ala Cys
580 585 590
Asp Leu Pro Asp Leu Thr Ser Leu Glu Ala Arg Asn Leu Gln Pro Gly
595 600 605
Leu Met Tyr Trp Trp Val Asp Lys Val Arg Lys Ala Ala Pro Pro Lys
610 615 620
Gly Pro Asp Gly Ile Pro Val Ile Pro Glu Pro Arg Phe Ala Val Ala
625 630 635 640

Gly Phe Glu Lys Val His Pro Gly Asn Tyr Ile Glu Ala Glu Leu Ala
645 650 655
Lys Met Asn Trp Asn His Lys Asp Thr Lys Val Gln Arg Gln Gly Ala
660 665 670
Tyr Gly Trp Ser Lys Lys Glu Asp Leu Pro Val Gln Arg Val Thr Ala
675 680 685
Ala Gly Leu Ala Asp Glu Leu Arg Lys Ala Asn Lys Lys Thr Ser Pro
690 695 700

Glu Leu Arg Arg Ala Glu Val Asp Lys Ile Val Asn Val Ile Val His
705 710 715 720
Pro Gln Leu His Gln Thr Leu Lys Met Ala Asn Ile Gly Asp Thr Pro

725 730 735

Gly Leu Ser Thr Ala Glu Ala Leu Ala Leu Trp Leu Arg Lys Thr Ile

740 745 750

Arg Gly Asn Leu Ser Lys Ala Arg Phe Ser Ser His Pro Ala Asp Gln

755 760 765

Ser Arg Ala Lys Met Leu Gln Asp Phe Ile Asn Gly Gln Ser Asn Val

770 775 780

Ile Pro Ala Val Ile Ala Val Gln Ile Leu Tyr Pro Ser Phe Lys Ser

785 790 795 800

Asn Met Asp Leu Asn Arg Val Asp Pro Gln Ser Gly Arg Leu Val His

805 810 815

Arg Tyr Val Ala Asp Pro Ala Asn Val Ala Tyr Ile Val Thr Tyr Arg

820 825 830

Gly Ser Asn Gly Asp Val Lys Arg Asp Arg Pro Leu Thr Leu Lys Trp

835 840 845

Arg Gln Ser Gly Ala Val Ile Pro Gly Val Lys Leu Phe Gly Asp Val

850 855 860

Pro Glu Gly Pro Leu Arg Gly Arg Ala Leu Gly Glu Lys Thr Ile Asp

865 870 875 880

Gln Lys Glu Trp Lys Ser Ala Leu His Gln Tyr Leu Ile Arg Ala Gly

885 890 895

Ile Ala Glu Tyr Asn Phe Val Ser Gln Gly Asn Val Val Val Tyr Glu

900 905 910

Asp Gly Ser Glu Leu Tyr Ile Arg Asn Phe Ser Gly Ser Tyr Gly Phe

915 920 925

Lys Lys Ser Trp Phe Lys Gly Ile Lys Ala Val Arg Pro Ser Pro Leu

930 935 940

Thr Glu Arg Leu Ile Pro Asn Ala Lys Leu

945 950

<210> 612

<211> 431

<212>

PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG102 effectors

<220><223> Description: MG102-33 effector

<400> 612

Ile Ile Arg Phe Cys Ala Arg Arg Gly Tyr Lys Ser Leu Trp Glu Thr
1 5 10 15

Asp Glu Lys Ser Gly Gly Glu Ser Lys Gly Asn Asp Asn Ile Val Tyr
20 25 30

His Tyr Gly Arg Glu Glu Phe Phe Ala Ala Leu Lys Thr Lys Leu Glu

35 40 45

Asp Ser Leu Ser Glu Gln Asn Ala Arg Asp Ser Leu Ser Ala Cys Glu
50 55 60

Gln Ile Leu Asn Cys His Gly Asp Pro Pro Leu Glu Ile Arg Pro Val
65 70 75 80

Arg Ile Glu Asn Arg Gly Val Ser Arg Cys Ala Trp Asp Gly Cys Asn
85 90 95

Lys Val Thr Pro Arg Leu Ala Asn Ala Leu Gln Asp Pro Leu Ala His

100 105 110

Val Val Phe Thr Val Tyr Lys Glu Arg Ile Ala Lys Glu Pro Gln Leu
115 120 125

Gln Ala Ala Ile Glu Ala Met Leu Asp Arg Val Ala Asp Leu Gly Lys
130 135 140

Arg Tyr His Ser Val Ser Gly Ala Asp Pro Ala Ala Glu Gln Lys Val
145 150 155 160

Leu Met Lys Arg Ile Arg Ala Glu Phe Ala Ile Leu Lys Arg Trp Leu

165 170 175

Ala Ser Ser Pro Asp Asn Glu Asp Gln Val Ser Lys Trp Lys Tyr Ile
180 185 190

Lys Ile Asn Leu Lys Ser Leu Ile Thr Arg Gln Glu Gly Arg Asn Arg

195 200 205

Phe Cys Arg Glu His Ser Ala Glu Tyr Val Gln His Leu Leu Ala Gly

210 215 220

Lys Pro Ile Gln Phe Lys Glu Thr Leu Ile Glu Arg Asp Ile Ala Ser

225 230 235 240

Arg Arg Glu Glu Ile Leu Phe Gln Lys Leu Trp Arg Tyr Ile Glu Ala

245 250 255

Arg Leu Leu Ser Leu Val Pro Asn His Ile Asp Arg Ile Val Val Glu

260 265 270

Arg Thr Ala Phe Asp Leu Leu Thr Gly Thr Gln Lys Gln Arg Gln Lys

275 280 285

Met Thr Glu Lys Ala Phe Glu Glu Met Tyr Gln Arg Gly Pro Arg Tyr

290 295 300

Gly Tyr Thr Asn Asp Leu Glu Met Leu Lys Lys Glu Phe Ala Gly Leu

305 310 315 320

Cys Ala Tyr Cys Gly Arg Leu Ser Gly Arg Leu Thr Glu Arg Glu His

325 330 335

Ile Leu Pro Gln Lys Asp Phe Phe Phe Asp Ser Tyr Val Asn Ile Val

340 345 350

Pro Ala Cys Asp Thr Cys Asn Ser Ser Leu Lys Glu Lys Leu Ser Gly

355 360 365

Gly Ala Val Gly Leu Arg Ile His Asp Ala Ala Tyr Glu Ala Tyr Ser

370 375 380

Gly Tyr Leu Arg Ser Lys Phe Lys Thr Asn Pro Pro His Ile Tyr Gln

385 390 395 400

Arg Ile Lys Lys Gly Ile Leu Asn Leu Met Arg Gln Pro Asp Arg Val

405 410 415

Trp Glu Ala Glu Asp Tyr Leu Thr Leu Ile Ser Asn Gln Leu Ala

420 425 430

<210> 613

<211> 145

<212> RNA

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG34 sgRNA

<220><223> Description: MG34-1 active effectors sgRNA 1

<220><221> modified_base

<222> (1)..(22)

<223> a, c, u, g, unknown or other

<400> 613

nnnnnnnnnn nnnnnnnnnn nnguuacagu uaagaaauua auuguaaaac gccuauacag 60

ugaagggaua uacgcuuggg uuuguccagc cugagccucu augccagaaa uggcgccuuc 120

aucgуggguu aggacauuua auuuu 145

<210> 614

<211> 157

<212> RNA

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG34 sgRNA

<220><223> Description: MG34-1 active effectors sgRNA 2

<220><221> modified_base

<222> (1)..(22)

<223> a, c, u, g, unknown or other

<400> 614

nnnnnnnnnn nnnnnnnnnn nnguuacagu uaaggcucug aaaagagccu uaauuguaaa 60

acgccuauac agugaaggga uauacgcuug gguuugucca gccugagccu cuaugccaga 120

aauggcgccu ucaucguggg uuaggacauu uaauuuu 157

<210> 615

<211> 138

<212> RNA

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG34 sgRNA

<220><223> Description: MG34-9 active effectors sgRNA 1

<220><221> modified_base

<222> (1)..(22)

<223> a, c, u, g, unknown or other

<400> 615

nnnnnnnnnn nnnnnnnnnn nnguuacagu uaagaaauua auuguaaaac gccuauacga 60

gaagauauau acgcuugggu uuguccagcc ugagccucua ugccagaaau ggcgccuuca 120

ucguggguua ggacauuu 138

<210> 616

<211> 145

<212> RNA

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG34 sgRNA

<220><223> Description: MG34-16 active effectors sgRNA 1

<220><221> modified_base

<222> (1)..(22)

<223> a, c, u, g, unknown or other

<400> 616

nnnnnnnnnn nnnnnnnnnn nnguuacagu uaagaaauua auuguaaaac gccuauacga 60

ugaagauaua uacgcuuggg uuuguccagc cugagccucu augccagaaa uggcaccuuc 120

aucguggguu aggacauuua auuuu 145

<210> 617

<211> 421

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-514 effector

<400> 617

Met Asn Val Val Tyr Val Leu Ser Pro Asp Arg Val Pro Leu Met Pro
1 5 10 15
Cys Ser Cys Ala Ile Ala Arg Leu Leu Leu Lys Gln Gly Lys Ala Lys
20 25 30

Val Val Arg Arg Thr Pro Phe Thr Ile Lys Met Tyr Thr Gln Pro Val
35 40 45
Asp Thr His Thr Gln Pro Leu Thr Leu Gly Ile Asp Thr Gly Ser Ala
50 55 60
Val Ile Gly Ser Ala Val Ser Asp Glu Cys Gly Asn Ile Leu Tyr Val
65 70 75 80
Ser Glu Gly Glu Val Arg Asn Asp Ile Ala Gln Thr Met Lys Asn Arg
85 90 95

Ala Thr Ser Arg Arg Asn Arg Arg Tyr Arg Lys Thr Arg Tyr Arg Pro
100 105 110
Ala Arg Trp Leu Asn Arg Arg Asn Ser Leu Lys Thr Gly Arg Phe Ser
115 120 125
Pro Thr Met Thr Ser Lys Thr Glu Ala His Leu Arg Glu Ile Arg Phe
130 135 140
Val Gln Ser Leu Leu Pro Ile Gln Ser Ile Val Leu Glu Thr Gly Thr
145 150 155 160

Phe Asn Pro His Ala Leu Lys His Pro Ala Val Leu Gln Asn Lys Trp
165 170 175
Met Tyr Gln Lys Gly Ile Asn Tyr Gly Leu Ala Asn Thr Lys Ala Tyr
180 185 190
Val Leu Thr Arg Asp Gly Tyr Val Cys Gln Arg Cys Lys Gly Gln Ser
195 200 205
Lys Asp Arg Arg Leu Glu Val His His Ile Val Phe Arg Ser Gln Gln
210 215 220

Gly Ser Asp Glu Glu Ala Asn Leu Leu Thr Leu Cys Lys Thr Cys His
225 230 235 240

Glu Gly Leu His Ala Gly Thr Val Thr Leu Lys Gln Lys Gly Lys Arg
245 250 255
Lys Gly Asn Leu Leu His Ala Thr Gln Met Asn Ser Ile Arg Ile Gln
260 265 270
Leu Leu Ser Arg Val Glu Ala Ile Glu Thr Trp Gly Phe Val Thr Lys
275 280 285

Glu His Arg Leu Leu Ala Gly Leu Pro Lys Glu His Ile Phe Asp Ala
290 295 300
Ala Met Ile Ala Thr Arg Gly Asn Ile Pro Val Phe Gln Thr Thr Glu
305 310 315 320
Val Leu Leu Lys Lys Cys Ile Ser Asp Gly Asp Tyr Gln Gln Thr Lys
325 330 335
Gly Lys His Ser Gln Gln Arg Ile Pro Thr Gly Lys Ile Ala Gly Phe
340 345 350

Arg Lys Phe Asp Lys Val Arg Tyr Leu Gly Val Glu Tyr Phe Ile Lys
355 360 365
Gly Arg Met Ser Thr Gly Tyr Ala Ile Leu Met Asp Leu Ser Gly Asn
370 375 380
Lys Leu Ala Leu Lys Pro Thr Pro Lys Phe Asp Asn Met Lys Arg Val
385 390 395 400
Ser Ala Arg Ser Ser Trp Ile Ile Asn Gln Lys Ala Leu Pro Ser Phe
405 410 415

Ser Ser Ser Pro Thr
420

<210> 618
<211> 457
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-515 effector

<400> 618

Met Ser Lys Ser Gln Ile Lys Lys Leu Ile Tyr Val Val Asp Ser Asn
1 5 10 15

Gly Lys Pro Leu Met Pro Thr Thr Arg Asn Arg Lys Val Arg His Trp
20 25 30

Leu Thr Thr Gly Gln Ala His Trp Phe Gly Asn Ser Arg Lys Thr Ile
35 40 45

Gln Phe Ala Arg Pro Val Asn Gln Asn Thr Gln Ser Val Thr Val Gly
50 55 60

Val Asp Leu Gly Arg His Thr Gly Ile Ser Ala Val Asp Gln Ser Asn
65 70 75 80

Asn Arg Glu Tyr Tyr Ser Ala Gln Val Glu Arg Pro Tyr Val Gln Glu
85 90 95

Val Lys Arg Asn Lys Gln Arg Lys Met Tyr Arg Thr Gln Lys Arg His
100 105 110

His Leu Arg His Arg Gln Val Arg Phe Asn Asn Arg Arg Lys Pro Thr
115 120 125

Gly Trp Leu Ala Pro Thr Ile Gln His Gln Leu Asp Phe Ile Asp His
130 135 140

Glu Ile Gln Arg Val Ser Gln Phe Leu Pro Val Asp Lys Ile Met Leu
145 150 155 160

Glu Asp Gln Pro Phe Asp Ile Arg Lys Leu Thr Asn Asp Asn Gln Arg
165 170 175

Pro Thr Asp Tyr Thr Lys Gly Pro Gln Ser Gly Phe Ala Ser Leu Lys
180 185 190

Glu Tyr Leu Tyr Ala Ser Gln Asn Gly Ile Asp Pro Ile Asn Gly Gln
195 200 205

Pro Tyr Pro Leu Ser Asp Met Val Val His His Leu Leu Pro Arg Ser
210 215 220

Gln Gly Gly Thr Asn Ser Pro His Asn Leu Val Leu Ile Ser Lys Glu
225 230 235 240

His His Asn Asn Ala Asn His His Asn Gly Val Leu Lys His Leu Ala
245 250 255
Gln Gln Leu Arg Asn Cys Leu Asp Thr Arg Gly Ala Cys Leu Met Asn
260 265 270
Ile Leu Tyr Asn Arg Leu Pro Glu Gln Leu Asn Asn Ile Ala Pro Val
275 280 285

Val Phe Thr Ala Gly Tyr Ile Thr Ala Gln Asn Arg Lys Thr Tyr Gly
290 295 300
Ile Asn Lys Ser His Val Asn Asp Ala Leu Ile Ile Ala Gly Gly Asn
305 310 315 320
Ala Gln Thr Ile Arg Leu Ala Pro Asn Ile Lys Arg Val Lys Leu Arg
325 330 335
Arg Asn Asn Arg Ser Leu Ala Lys Phe Tyr Asp Ala Lys Tyr Glu Asp
340 345 350

Leu Arg Asp Gly Gln Thr Lys Ser Gly Gln Glu Leu Ser Ser Gly Arg
355 360 365
Thr Ser Arg Ser Arg Glu Leu His Tyr Asp Asn Gln Arg Ile Tyr Arg
370 375 380
Ala Arg Lys Thr Lys Lys Gly Arg Thr Ser Ile Arg Lys Asn His Tyr
385 390 395 400
Gln Leu Arg Pro His Asp Leu Val Lys Tyr Gln Asn His Ile Tyr Ala
405 410 415

Val Asn Gly Val His Ser Asn Gly Tyr Arg Val Leu Leu Phe Ile Asn
420 425 430
Gly Lys Lys Lys Ser Val Ala Ile Ser Lys Val Thr Cys Ile Lys His
435 440 445
Val Asn Gly Ile Leu Glu Thr Ile Leu
450 455

<210> 619
<211> 433
<212> PRT
<213> Unknown

<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-516 effector

<400> 619

Met Gln Asn Arg Val Phe Val Ile Asn Lys His Gly Glu Ala Leu Met
1 5 10 15
Pro Cys Lys Pro Arg Thr Ala Arg Lys Leu Leu Thr Gln Gly Lys Ala
20 25 30
Lys Pro Ile Lys Lys Glu Pro Phe Thr Ile Gln Leu Leu Tyr Gly Ser
35 40 45
Thr Gly Tyr Lys Gln Asp Val Ser Leu Gly Ile Asp Ser Gly Gln Arg
50 55 60

His Ile Gly Ile Ala Val Thr Ser Gln Asp Lys Val Leu Phe Gln Gly
65 70 75 80
Glu Val Glu Leu Arg Gln Asp Val Lys Lys Leu Leu Asp Thr Arg Arg
85 90 95
Thr Tyr Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg Lys Ala
100 105 110
Arg Phe Leu Asn Arg Ile Lys Thr Lys Lys Asn Gly Trp Leu Pro Pro
115 120 125

Ser Val Ala Gly Lys Cys Arg His Asn Ile Asn Trp Ile Asn Arg Phe
130 135 140
Leu Ala Val Leu Pro Asn Leu Ala Leu His Ile Glu Val Gly Lys Phe
145 150 155 160
Asp Met Gln Lys Met Lys Asp Pro Asp Ile Gln Gly Val Gly Tyr Gln
165 170 175
Tyr Gly Asp Leu Tyr Gly Tyr Gln Thr Val Lys Gln Tyr Val Leu Ala
180 185 190

Arg Asp Lys Tyr Lys Cys Gln Val Cys Lys Lys Thr Gly Gly Lys Leu
195 200 205

Lys Ile His His Ile Ile Tyr His Ser Gln Gly Gly Thr Asn Val Pro
210 215 220
Ser Asn Leu Ile Thr Val Cys Ala Asp Cys His Thr Tyr Lys Asn His
225 230 235 240
Gln Pro Gly Gly Val Leu Tyr Lys Trp Tyr Gln Ala Lys Lys Lys Val
245 250 255

Thr Lys Ser Leu Lys Gly Ala Thr Phe Met Asn Ile Leu Arg Arg Arg
260 265 270
Leu Trp Arg Ala Phe Pro Asp Ala Glu Phe Gln Tyr Gly Ala Gln Thr
275 280 285
Thr Leu Gln Arg Ala Asp Leu Gly Leu Asp Lys Ser His Phe Asn Asp
290 295 300
Ala Val Thr Ile Ser Gly Ile Gln Lys Ile Thr Glu Lys Pro Thr Ser
305 310 315 320

Val Val Met Phe Lys Gln Phe Arg Lys Lys Lys Arg Ser Leu His Glu
325 330 335
Ala Thr Ala Arg Lys Gly Arg Lys Glu Pro Asn Arg Thr Ser Lys Arg
340 345 350
Asn Ala Lys Asn Thr Lys Phe Ala Lys Gly Phe Trp Leu Asn Asp Tyr
355 360 365
Val Arg Ile Lys Asn Ser Arg Lys Lys Gly Phe Ile Ser Gly Phe Thr
370 375 380

Gly Ser Ser Cys Tyr Leu Lys Asp Cys Leu Gly Asn Tyr Val Ile Ile
385 390 395 400
Arg Lys Tyr Lys Gln Thr Val Leu Ser Lys Leu Met Met Ile Asn His
405 410 415
His Asn Asn Trp Cys Ser Thr Glu Ile Ser Val Asn Lys Tyr Met Met
420 425 430
Arg

<210> 620
<211> 434

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-517 effector

<400> 620

Met Glu Asn Arg Val Phe Val Leu Asn Gln His Gly Lys Ala Leu Met
1 5 10 15

Pro Cys Ser Pro Arg Lys Ala Arg Ile Leu Leu Arg Asp Glu Lys Ala
20 25 30

Lys Val Ile Lys Lys Glu Pro Phe Thr Ile Gln Leu Phe Tyr Gly Ser
35 40 45

Thr Gly Tyr Lys Gln Asn Val Asn Leu Gly Ile Asp Ser Gly Gln Arg

50 55 60

His Ile Gly Ile Ala Val Thr Ser Gln Asp Lys Val Leu Phe Gln Gly
65 70 75 80

Glu Val Glu Leu Arg Gln Asp Val Lys Ser Leu Leu Tyr Thr Arg Arg
85 90 95

Ile Tyr Arg His Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg Lys Ala
100 105 110

Arg Phe Leu Asn Arg Val Gly Lys Lys Lys Asp Asn Trp Leu Pro Pro

115 120 125

Ser Val Ala Ser Lys Val Asp His Asn Ile Asn Trp Thr Asn Arg Phe
130 135 140

Leu Ala Val Leu Pro Asn Pro Ala Leu His Ile Glu Val Gly Lys Phe
145 150 155 160

Asp Ile Gln Lys Met Lys Asp Pro Thr Ile Asn Gly Leu Gly Tyr Gln
165 170 175

Gln Gly Asp Leu Tyr Gly Tyr Gln Thr Val Lys Gln Phe Val Leu Ala

180 185 190

Arg Asp Asn Tyr Thr Cys Gln Val Cys Lys Gln Lys Gly Gly Lys Leu
195 200 205
Lys Val His His Ile Val Tyr Arg Ser Leu Gly Gly Thr Asn Thr Val
210 215 220
Asp Asn Leu Ile Thr Val Cys Ala Glu Cys His Thr Ala Lys Asn His
225 230 235 240
Gln Ser Gly Ile Leu Ala Lys Trp Cys Lys Val Lys Lys Lys Val Thr

245 250 255
Lys Ser Tyr Gln Gly Ala Thr Phe Met Asn Ile Leu Arg Arg Arg Leu
260 265 270
Phe Thr Ala Phe Pro Gln Ala His Phe Gln Tyr Gly Ala Gln Thr Thr
275 280 285
Leu Gln Arg Ala Gly Leu Asp Leu Ser Lys Ser His Tyr Asn Asp Ala
290 295 300
Val Ala Ile Ser Gly Ile Gln Lys Ile Asp Ala Lys Pro Thr Ser Ile

305 310 315 320
Val Met Phe Asn Gln Phe Arg Lys Lys Lys Arg Ser Leu His Glu Ala
325 330 335
Asn Pro Arg Lys Gly Arg Lys Thr Pro Asn Val Thr Ser Lys Arg Asn
340 345 350
Ala Lys Asn Thr Lys Tyr Ala Lys Gly Phe Trp Leu Asn Asp Tyr Val
355 360 365
Arg Ile Lys Ser Ser Arg Lys Lys Gly Phe Ile Ser Gly Phe Met Ala

370 375 380
Arg Gly Phe Ala Val Tyr Leu Arg Asp Ile Phe Gly His Tyr Val Ser
385 390 395 400
Ala Thr Asp Lys Asn Tyr Thr Thr Ala Lys Asn Leu Met Leu Ile Asn
405 410 415
His His Asn Asn Trp Gln Met Gln Ser Ile Ser Glu Lys Tyr Tyr Arg
420 425 430
Met Gly

<210> 621

<211> 436

<212

> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-518 effector

<400> 621

Met Thr Lys Thr Leu Thr Thr Arg Thr Thr Gln Ala Cys Val Leu Asp
1 5 10 15

Arg Gln Gly Lys Pro Leu Met Pro Thr Thr Arg Leu Ser Lys Val Tyr
20 25 30

Arg Leu Leu Lys Thr Gln Lys Ala His Ile Val Ser Tyr Glu Pro Phe
35 40 45

Thr Ile Gln Leu Asp Tyr Glu Pro Asp Thr His Val Ile Gln Pro Met
50 55 60

Thr Leu Gly Ile Asp Ser Gly Ala Ile His Ser Gly Tyr Ser Ile Ala
65 70 75 80

Asn Glu His Arg Glu Tyr Tyr Asn Ser Glu Ile Ile Ala Arg Asp Asp
85 90 95

Ile Ser Arg Asn Leu Ser Asp Arg His Met Tyr Arg Gln Ser Arg Arg
100 105 110

Ala Arg Lys Thr Arg Tyr Arg Lys Pro Arg Phe Asn Asn Arg Lys Asn
115 120 125

Lys Lys Lys Gly Trp Leu Pro Pro Ser Leu Gln Gln Lys Val Ala Thr
130 135 140

Gln Leu Asn Glu Ile Asp His Ile His Arg Tyr Phe Pro Ile Glu Thr
145 150 155 160

Ile Ile Val Glu Thr Ala Glu Phe Asp Ile Gln Lys Ile Lys Asn Pro
165 170 175

Asp Ile Ser Gly Val Glu Tyr Gln Gln Gly Thr Leu Gln Gly Tyr Asn
180 185 190
Ile Arg Asn Tyr Leu Leu Glu Lys His Gly Arg Lys Cys Phe Tyr Cys
195 200 205
Gly Lys Thr Val Ser Asp Phe Glu Val Glu His Met Thr Pro Lys Ala
210 215 220
Arg Gly Gly Ser Asn Arg Ile Asp Asn Leu Thr Leu Ser Cys His Glu

225 230 235 240
Cys Asn Gln Lys Lys Asp Thr Leu Thr Ala Glu Glu Phe Ile Gln Gln
245 250 255
Thr Leu Ser Ala Lys Lys Ala Ala Thr Lys Leu Lys Gln Leu Pro Asn
260 265 270
Glu Lys Arg Leu Phe Lys Tyr Met Ala His Met Asn Ala Thr Arg Trp
275 280 285
Thr Leu Tyr Asp Ala Ile Asn Glu Lys Tyr Pro Asn Val Lys Met Thr

290 295 300
Tyr Gly Tyr Ile Thr Lys Tyr Asn Arg Ile Gln Ala Gly Leu Pro Lys
305 310 315 320
Ala His His Ile Asp Ala Lys Cys Ile Thr Gly Phe Ala Thr Val Pro
325 330 335
Ser Met Ser Gln Thr Val Val Lys Val Lys Met Arg Arg His Asn Arg
340 345 350
Gln Leu His Arg Ala Thr Phe Ser Lys Gly His Val Arg Lys Ala Ala

355 360 365
Ser Leu Pro Thr Thr Val Phe Gly Phe Gln Leu Tyr Asp Leu Val Cys
370 375 380
Phe Asn Asn His Arg Tyr Tyr Ile Lys Ser Arg Arg Ser Ser Gly Ala
385 390 395 400
Phe Val Leu Val Ser Val Glu Gly Leu Lys Asn Glu Glu Arg Met Tyr
405 410 415
Lys Lys Leu Thr Leu Leu Ala His Thr Asn Ala Tyr Leu Thr Asn His

420 425 430

Tyr Val Asn Ala

435

<210> 622

<211> 499

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-519 effector

<400> 622

Met Arg Tyr Val Tyr Val Leu Asp Val Asp Glu Lys Pro Leu Met Pro

1 5 10 15

Thr Cys Arg Phe Gly Lys Val Arg Arg Met Leu Lys Ser Gly Gln Ala

20 25 30

Lys Ala Val Asp Thr Leu Pro Phe Thr Ile Gln Leu Thr Tyr Arg Thr

35 40 45

Lys Thr Arg Ile Leu Gln Pro Val Thr Leu Gly Gln Asp Pro Gly Arg

50 55 60

Thr Asn Ile Gly Met Ala Ala Val Arg Phe Asp Gly Lys Glu Leu Gly

65 70 75 80

Arg Phe His Cys Ile Thr Arg Asn Lys Glu Ile Pro Lys Leu Met Ala

85 90 95

Asp Arg Met Ala Ala Arg Lys Ala Ser Arg Arg Gly Glu Arg Leu Ala

100 105 110

Arg Lys Arg Leu Ala Arg Lys Leu His Thr Thr Ala Lys His Leu Glu

115 120 125

Gly Arg Met Leu Pro Gly Cys Ser Glu Pro Ile Ala Val Lys Asp Ile

130 135 140

Ile Asn Thr Glu Ser Arg Phe Asn Asn Arg Leu Arg Pro Glu Gly Trp

145 150 155 160

Leu Thr Pro Thr Ala Thr Gln Leu Leu Arg Thr His Ile Asn Leu Phe
165 170 175
Arg Lys Leu Ser Gly Ile Leu Pro Val Thr Asp Val Thr Val Glu Leu
180 185 190
Asn Lys Phe Ala Phe Met Gln Leu Asp Asn Pro Glu Met Lys Lys Arg
195 200 205
Glu Ile Asp Phe Cys His Gly Pro Leu Cys Gly Thr Gly Gly Leu Glu

210 215 220
Ala Ala Val Lys Glu Gln Gln Asp Gly Lys Cys Leu Leu Tyr Gly Lys
225 230 235 240
Glu Ser Ile Gly His Tyr His His Ile Val Pro Arg Ser Arg Arg Gly
245 250 255
Ser Asn Thr Ile Ala Asn Ile Ala Gly Leu Cys Pro Lys Cys His Glu
260 265 270
Leu Val His Lys Asp Ala Asp Thr Ala Glu Arg Leu Thr Glu Met Lys

275 280 285
Thr Gly Leu Thr Lys Lys Tyr Gly Gly Thr Ser Val Leu Asn Gln Ile
290 295 300
Ile Pro Lys Leu Val Glu Thr Leu Ala Asp Leu Phe Pro Gly His Phe
305 310 315 320
His Val Thr Asn Gly Trp Asn Thr Lys Glu Phe Arg Glu Lys His His
325 330 335
Leu Glu Lys Asp His Asp Val Asp Ala Tyr Arg Ile Ala Cys Ser His

340 345 350
Leu Lys Pro Glu Glu Thr Leu Val Glu Thr Glu Pro Phe Glu Ile Leu
355 360 365
Gln Phe Arg Lys His Asn Arg Ala Ile Ile His His Gln Thr Glu Arg
370 375 380
Thr Tyr Lys Leu Asp Gly Val Thr Val Ala Lys Asn Arg Lys Lys Arg
385 390 395 400
Met Glu Gln Lys Thr Asp Ser Leu Glu Asp Trp Tyr Val Asp Met Ala

405 410 415

Lys Glu His Gly Lys Thr Gln Ala Asp Ala Met Arg Ser Arg Leu Ala

420 425 430

Val Ile Lys Ser Thr Arg Tyr Tyr Asn Thr Pro Gly Arg Met Met Pro

435 440 445

Gly Thr Val Phe Leu Tyr Glu Gly Lys Arg Tyr Val Met Thr Gly Gln

450 455 460

Ile Thr Asn Gly Lys Tyr Tyr Arg Ala Tyr Asp Gln Glu Lys Arg Asn

465 470 475 480

Phe Pro Ala Val Lys Val Arg Ile Leu Thr Lys Asn Thr Gly Leu Val

485 490 495

Phe Val Ala

<210> 623

<211> 425

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-520 effector

<400> 623

Met Leu Val Tyr Val Val Thr Lys Asp Lys Gln Pro Leu Met Pro Cys

1 5 10 15

Thr Pro Val Ile Ala Arg Leu Leu Leu Lys Gln Glu Lys Ala Lys Val

20 25 30

Lys Arg Arg Asp Pro Phe Thr Ile Gln Leu Leu Tyr Glu Thr Thr Glu

35 40 45

Tyr Arg Gln Asp Leu Glu Leu Gly Val Asp Thr Gly Ser Gly Lys Phe

50 55 60

Ala Thr Ala Val Arg Thr Glu Gln Asn Glu Ile Val Tyr Leu Ser Glu

65 70 75 80

Val Ala Val Arg Asn Asp Ile Thr Ser Lys Met Thr Glu Arg Arg Thr
85 90 95
Lys Arg Arg Ser Arg Arg His Arg Lys Thr Arg Tyr Arg Lys Pro Arg
100 105 110
Phe Asp Asn Arg Arg Asn Ser Lys Arg Lys Asp Arg Phe Ser Pro Thr
115 120 125
Met Gln Ser Lys Ile His Ser His Val Lys Glu Ile Glu Tyr Ile Gln
130 135 140

Ser Ile Leu Pro Ile Thr Arg Ile Ile Leu Glu Thr Gly Gln Phe Asp
145 150 155 160
Pro His Arg Met Lys Asn Pro Ala Leu Ala Asp Pro Asn Val Arg His
165 170 175
Trp Gly Tyr Gln Lys Gly Pro Asn Tyr Gly Tyr Glu Asn Thr Arg Ala
180 185 190
Met Val Leu Asp Arg Asp Asn His Gln Cys Gln Cys Cys His Gly Lys
195 200 205

Arg Lys Asp Arg His Leu Glu Val His His Ile Val Phe Arg Ser Gln
210 215 220
Gly Gly Ser Asp Asp Ala Lys Asn Leu Ile Thr Leu Cys His Thr Cys
225 230 235 240
His Gln Ala Leu His Lys Gly Lys Ile His Leu Asp Leu Glu Gly Met
245 250 255
Gly Lys Gly Thr Leu Lys Tyr Ala Thr Gln Met Asn Ser Ile Arg Lys
260 265 270

Gln Leu Leu Arg Arg Tyr Ser Glu Ala Val Glu Thr Tyr Gly Tyr Ile
275 280 285
Thr Lys Ala Asn Arg Leu Ala Met Asp Leu Pro Lys Glu His Tyr Ile
290 295 300
Asp Ala Cys Val Ile Ala Thr Glu Gly Arg Gln Phe Thr Ile Asn Ser
305 310 315 320
Leu Leu Tyr Arg Lys Lys Cys Val Ser Ala Gly Asp Phe Gln Gln Tyr

325 330 335

His Gly Glu Arg Ser Glu Ile Arg Gln Thr Thr Gly Lys Ile Met Gly
340 345 350
Phe Arg Lys Tyr Asp Lys Val Arg Tyr Phe Gly Lys Tyr Tyr Phe Ile
355 360 365
Lys Gly Arg Met Ser Thr Gly Tyr Ala Val Leu Met Asp Val Asn Gly
370 375 380
Asp Thr Val Lys Phe Ser Asp Met Pro Trp Gly Phe Lys Thr Pro Lys
385 390 395 400

Leu Glu Arg Met Glu Arg Ile Gln Ala Arg Ser Thr Trp Met Val Met
405 410 415
Gly Glu Lys Val Thr Leu Asn Ile Val
420 425

<210> 624
<211> 518
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-521 effector
<400> 624
Met Thr Asn Leu Lys Leu Ile Asn Glu Leu Leu Asp Lys Thr Glu Tyr
1 5 10 15

Ile Tyr Val Leu Gly Ala Asp Gly Lys Pro Gln Met Pro Thr Asn Arg
20 25 30
Lys Val Arg Val Arg Lys Leu Phe Lys Leu Gly Met Ala Lys Ile Val
35 40 45
Asp Thr Met Pro Phe Thr Met Gln Leu Leu Tyr Glu Asn Lys Pro Val
50 55 60
Leu Gln Pro Ile Thr Ile Ala Glu Asp Pro Gly Arg Thr Asn Ile Gly

65 70 75 80

Ala Ala Val Leu Thr Gln Leu Gly Asn Leu Val Phe Ser Ala Val Val
85 90 95
Glu Thr Arg Asn Lys Ser Ile Lys Lys Leu Met Ser Asp Arg Lys Ala
100 105 110
His Arg Gln Ala Ser Arg Arg Gly Glu Arg Lys Ala Arg Gln Arg Leu
115 120 125
Ala Lys Lys Tyr Lys Ser Met Ile Lys Ala Gly Met Ile Met Arg Lys
130 135 140

Leu Pro Gln Tyr Ala Ala Asp Lys Phe Val Thr Cys Lys Ile Ile Lys
145 150 155 160
Asn Thr Glu Ala Arg Phe Cys Asn Arg Lys Arg Met Pro Gly Trp Leu
165 170 175
Met Pro Thr Val Asn His Leu Val Gln Thr His Ile Asn Leu Ile Lys
180 185 190
Lys Ile Glu Lys Tyr Leu Pro Ile Thr Asp Val Ala Ile Glu Val Asn
195 200 205

Arg Phe Ala Phe Met Gln Met Glu Asn Pro Asn Ile Ser Gly Val Asp
210 215 220
Phe Gln Asn Gly Pro Leu Lys Gly Phe Asp Asp Val Lys Ala Ala Ile
225 230 235 240
Arg Glu Gln Gln His Gly Lys Cys Leu Met Cys Lys Asn Asp Ile Glu
245 250 255
His Phe His His Ile Val Pro Arg Ser Lys Gly Gly Ser Asp Thr Ile
260 265 270

Gln Asn Gln Ala Gly Leu Cys Lys Lys Cys His Ala Lys Val His Thr
275 280 285
Asp Ala Glu Phe Gln Ala Lys Phe Lys Asp Lys Lys Glu Gly Leu Ile
290 295 300
Lys Lys Tyr Gly Ala Leu Ser Ala Leu Asn Gln Ala Val Pro Phe Ile
305 310 315 320

Cys Lys Glu Leu Leu Lys Ile Tyr Gly Val Lys His Val His Phe Cys
325 330 335

Thr Gly Lys Asp Thr Ser Leu Ile Arg Ser Ser Leu Gly Tyr Glu Lys
340 345 350
Thr Lys Asp Asn Gln Met His Glu Val Asp Ala Tyr Cys Ile Gly Leu
355 360 365
Ala Ala Ile Gly Ala Asp Lys Val Lys Cys Pro Asp Leu Asn Asn Val
370 375 380
Phe Lys Ile Lys Gln Phe Arg Arg Gln Asp Arg Ser Ile Ile Asn Tyr
385 390 395 400

Gln Arg Glu Arg Thr Tyr Tyr Leu Glu Gly Lys Lys Ile Ala Thr Asn
405 410 415
Arg Lys Pro Arg Phe Glu Gln Lys Gly Asp Ala Leu Ser Asp Trp Tyr
420 425 430
Ser Glu Gln Val Lys Leu Lys Gly Lys Lys Tyr Ala Asp Lys Leu Thr
435 440 445
Gly His Ile Thr Val Lys Lys Ser Thr Arg Gly Tyr Asn Ser Lys Asp
450 455 460

Arg Val Met Pro Gly Thr Ile Phe Tyr Tyr Asn Gly Lys Arg Leu Val
465 470 475 480
Leu Thr Gly Gln Leu Thr Gly Gly Lys Tyr Tyr Arg Ala Tyr Gly Asp
485 490 495
Thr Lys Thr Asn Tyr Pro Val Asn Lys Cys Gln Ile Tyr Lys His Asn
500 505 510
Glu Gly Leu Val Phe Val
515

<210> 625
<211> 419
<212> PRT
<213> Unknown
<220><223>
Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-522 effector

<400> 625

Met Val Tyr Val Ile Ser Gln Asp Ser Lys Pro Leu Met Pro Cys Ser
1 5 10 15

Asn Pro Ile Ala Arg Leu Leu Leu Lys Gln Gly Lys Ala Lys Val Lys
20 25 30

Arg Arg Glu Pro Phe Thr Ile Lys Leu Ile Tyr Glu Thr Thr Asp Tyr
35 40 45

Thr Gln Asp Leu Thr Leu Gly Val Asp Thr Gly Ser Gly Thr Ile Gly
50 55 60

Ala Ala Val Ser Lys Asp Asn Gly Asp Ile Val Tyr Met Ser Glu Val
65 70 75 80

Val Val Arg Asn Asp Ile Thr Asp Lys Met Thr Gln Arg Ala Lys Tyr
85 90 95

Arg Arg Asn Arg Arg Asn Arg Lys Thr Arg Tyr Arg Lys Ala Arg Trp
100 105 110

Leu Asn Arg Ser Asn Ser Ile Lys Lys Asp Arg Phe Ser Pro Thr Met
115 120 125

Gln Ser Lys Leu His Ser His Val Lys Glu Ile Glu Tyr Ile Gln Ser
130 135 140

Ile Leu Pro Ile Thr Glu Met Val Phe Glu Thr Gly Gln Phe Asp Met
145 150 155 160

His Leu Met Lys Asp Pro Ser Leu Ala Asn Pro Lys Val Arg Pro Trp
165 170 175

Gly Tyr Gln Lys Gly Thr Asn Tyr Gly Phe Glu Asn Thr Lys Ala Met
180 185 190

Val Leu Asn Arg Asp Asn Tyr Thr Cys Gln Cys Cys Lys Gly Lys His
195 200 205

Lys Asp Ser Lys Leu Glu Val His His Ile Val Phe Arg Ser Gln Gly
210 215 220

Gly Ser Asp Glu Glu Ser Asn Leu Ile Thr Leu Cys His Thr Cys His
225 230 235 240

Lys Asp Leu His Ser Gly Lys Ile Asn Leu Lys Leu Ser Gly Lys Val
245 250 255
Lys Gly Asn Leu Lys Tyr Ala Thr Gln Met Asn Ser Ile Arg Lys Gln
260 265 270
Leu Phe Arg Leu Tyr Pro Asn Ala Ile Glu Thr Phe Gly Tyr Val Thr
275 280 285
Lys Ala Asn Arg Leu His Leu Gly Val Asp Lys Glu His Tyr Tyr Asp
290 295 300

Ala Cys Thr Ile Ala Thr Gln Gly Asn Thr Phe Asn Val Lys Ser Asn
305 310 315 320
Leu Tyr Lys Lys Lys Cys Val Ser Asp Gly Asp Phe Gln Lys Thr Lys
325 330 335
Gly Ile Cys Ser Glu Gln Pro Ile Val Thr Asp Lys Ile Cys Gly Phe
340 345 350
Arg Lys Phe Asp Lys Val Arg Tyr Phe Gly Lys Asp Tyr Phe Ile Lys
355 360 365

Gly Arg Met Ser Thr Gly Tyr Ala Ile Leu Met Asp Ile Asp Gly Asn
370 375 380
Lys Ile Asp Phe Ser Thr Met Pro Arg Gly Tyr Lys Thr Pro Lys Leu
385 390 395 400
Ser Asn Cys Lys Arg Ile Thr Ala Arg Ser Thr Val Met Thr Gln Val
405 410 415
Lys Val Val

<210> 626
<211> 460
<212> PRT
<213> Unknown
<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-523 effector

<400> 626

Met Val Val Tyr Val Leu Asn Lys Asn Asn Lys Pro Leu Met Pro Cys
1 5 10 15

Lys Pro Gln Arg Ala Arg Lys Leu Ile Lys Glu Lys Lys Ala Lys Ile
20 25 30

Val Asn Tyr Lys Pro Phe Thr Ile Lys Leu Ile Tyr Gly Ser Tyr Gly
35 40 45

Tyr Thr Gln Asn Thr Asn Leu Gly Val Asp Leu Gly Ser Lys Asn Ile
50 55 60

Gly Ile Ala Val Thr Thr Gln Asn Lys Val Leu Ala Lys Gly Glu Ile
65 70 75 80

Glu Leu Arg Gln Asp Val Ser Ser Leu Ile Glu Thr Lys Lys Ile Leu
85 90 95

Arg Arg Gly Arg Arg Ser Arg Lys Thr Arg Tyr Arg Arg Cys Lys Phe
100 105 110

Asn Phe Arg Asn Lys Arg Val Phe Asn Ala Pro Lys Gly Ala Lys Leu
115 120 125

Lys Thr Leu Lys Lys Gly Ser Asp Ser Lys Lys Asn Trp Arg Thr Leu
130 135 140

Ser Thr Asn Ile Asp Ser Asn Arg Pro Val Gly Trp Leu Pro Pro Ser
145 150 155 160

Ile Gln Ser Lys Ile Asp Asn Thr Phe Phe Trp Ile Asp Lys Tyr Tyr
165 170 175

Asn Leu Leu Pro Lys Cys Asn Leu Ser Ile Glu Val Gly Lys Phe Asp
180 185 190

Met Ala Lys Met Ile Asn Pro Glu Ile Glu Gly Ala Asp Tyr Gln Gln
195 200 205

Gly Glu Ala Phe Gly Phe Tyr Asn Thr Arg Tyr Phe Val Phe Ala Arg
210 215 220

Asp Asn Tyr Thr Cys Gln Val Cys Lys Lys Asn Lys Asp Lys Val Leu
225 230 235 240

His Thr His His Val Ile Tyr Lys Ser Lys Gly Gly Ser Asp Arg Ala
245 250 255

Asp Asn Leu Ala Thr Ile Cys Thr Asp Cys His Thr Ser Glu Asn His
260 265 270

Lys Pro Gly Gly Ile Leu Tyr Glu Trp Met Ile Lys Lys Lys Lys Met
275 280 285

Lys Thr Tyr Lys Glu Pro Pro Phe Met Asn Ser Met Arg Val Lys Val
290 295 300

Phe Lys Lys Tyr Pro Gln Ala Asn Ile Thr Tyr Gly Ser Ile Thr Thr
305 310 315 320

Pro Arg Arg Lys Glu Leu Gly Leu Glu Lys Thr His Tyr Asn Asp Ala
325 330 335

Ile Ala Ile Ser Lys Val Glu Cys Ile Asn Gln Asn Cys Asp Glu Val
340 345 350

Phe Lys Ile Lys Gln Phe Arg Lys Lys Lys Arg Ser Leu His Glu Ala
355 360 365

Thr Ala Arg Lys Gly Arg Lys Thr Lys Asn Thr Glu Ser Lys Arg Asn
370 375 380

Glu Lys Asn Thr Ser Phe Ala Asn Gly Phe Tyr Leu Asn Asp Lys Val
385 390 395 400

Glu Ile Phe Gly Gln Ile Gly Tyr Ile Thr Gly Phe Ser Gly Lys Ser
405 410 415

Ser Ala Tyr Val Lys Asn Ile Asn Asp Glu Tyr Ile Thr Ile Pro Gly
420 425 430

Lys Lys Tyr Lys Gln Val Ser Ile Ser Ala Leu Lys Phe Ile Asn His
435 440 445

Asn Asn Asn Trp Gln Tyr Glu Ser Asn Phe Ala Ile
450 455 460

<210> 627

<211> 512

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-524 effector

<400> 627

Met Ser Thr Val Tyr Val Leu Asn Lys Asp Gly Lys Thr Leu Met Pro
1 5 10 15

Thr Thr Arg Cys Gly His Val Arg His Leu Leu Lys Lys Gln Lys Ala
20 25 30

Arg Val Val Thr Ser Asn Pro Phe Thr Ile Gln Leu Leu Tyr Glu Thr
35 40 45

Asp Asp Val Val Gln Pro Leu Tyr Leu Gly Ile Asp Pro Gly Arg Thr
50 55 60

Asn Ile Gly Val Ala Val Val Lys Ala Asp Gly Thr Ala Val Phe Thr
65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Gly Ile Pro Lys Leu Met Lys Lys
85 90 95

Arg Lys Asp Ser Arg Arg Ala Arg Arg Thr Asn Gly Arg Arg Cys Arg
100 105 110

Arg Gln Arg Arg Ala Lys Ala Asn Gly Thr Ile Ser Lys Lys Cys Val
115 120 125

Lys Gln Ala Thr Ala Gln Asn Gly Ser Ala Ser Lys Arg Ala Lys Lys
130 135 140

Ile Gly Val Ile Lys Arg His Leu Pro Gly Cys Glu Lys Glu Val Leu
145 150 155 160

Cys Ile Gly Ile Lys Asn Lys Glu Ala Lys Phe Asn Asn Arg Thr Arg
165 170 175

Pro Ala Gly Trp Leu Thr Pro Thr Ala Asn Gln Leu Leu Gln Thr His
180 185 190

Ile Asn Leu Ile Lys Lys Ile Gln Lys Leu Leu Pro Ile Ser Asp Val
195 200 205

Val Leu Glu Ile Asn Lys Phe Ala Phe Met Gln Leu Asp Asn Pro Asn
210 215 220
Ile Gln Lys Trp Gln Tyr Gln Gln Gly Pro Leu Tyr Gln Lys Ala Asn
225 230 235 240
Leu Glu Glu Ala Val Ser Glu Met Gln Glu His His Cys Leu Phe Cys
245 250 255
Lys Lys Lys Ile Asp His Tyr His His Val Val Pro Gln His Lys Asn
260 265 270

Gly Ser Asn Thr Ile Asp Asn Ile Val Gly Leu Cys Thr Lys His His
275 280 285
Asp Leu Val His Lys Asp Thr Ala Trp Tyr Glu Lys Leu Thr Lys Lys
290 295 300
Lys Thr Gly Leu Asn Lys Lys Tyr Gly Ala Leu Ser Val Leu Asn Gln
305 310 315 320
Ile Ile Pro Ala Leu Thr Lys Gly Leu Ser Ser Leu Phe Gln Lys His
325 330 335

Phe Phe Val Thr Thr Gly Lys Ser Thr Tyr Asp Tyr Arg Ala Ala His
340 345 350
Gly Val Ser Lys Asp His Trp Leu Asp Ala Tyr Cys Ile Ala Cys Ser
355 360 365
Val Leu Pro Asn Asp Val Cys Asp Ser Asn Ile Asn Ser His Val Pro
370 375 380
Tyr Glu Leu Lys Gln Phe Arg Arg His Asp Arg Arg Ala Leu His Lys
385 390 395 400

Glu Asn Ile Asn Arg Val Tyr Thr Leu Asn Gly Lys Lys Val Ala Thr
405 410 415
Asn Arg His Lys Ala Ile Glu Gln Thr Thr Asp Ser Leu Glu Glu Phe
420 425 430
Arg Gln Asn His Pro Asp Asp Val Cys Lys Leu Lys Val Lys Glu His

435 440 445

His Pro Glu Tyr Arg Asn Pro Lys Arg Asn Phe Pro Gly Cys Val Phe

450 455 460

Leu Val Gly Lys Arg Thr His Val Met Gln Gly Thr Ser Gly Ser His

465 470 475 480

Asn Gly Lys Ala Asp Gly Tyr Tyr Asp Thr Asn Gly Asn Ser Tyr Pro

485 490 495

Ser Gly Lys Cys Lys Phe Val Ala Lys Asn Lys Gly Ile Val Phe Ala

500 505 510

<210> 628

<211> 512

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-525 effector

<400> 628

Met Ser Thr Val Tyr Val Leu Asn Lys Asp Gly Lys Pro Leu Met Pro

1 5 10 15

Thr Ala Arg Cys Gly His Val Arg His Leu Leu Lys Glu Gln Lys Ala

20 25 30

Arg Val Val Thr Ser Lys Pro Phe Thr Ile Gln Leu Leu Tyr Glu Thr

35 40 45

Asp Asp Val Val Gln Pro Leu Tyr Leu Gly Ile Asp Pro Gly Arg Thr

50 55 60

Asn Ile Gly Val Ala Val Val Lys Ala Asp Gly Thr Ala Val Phe Thr

65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Glu Ile Pro Lys Leu Met Lys Lys

85 90 95

Arg Lys Asp Ser Arg Arg Ala Arg Arg Thr Asn Gly Arg Arg Cys Arg

100 105 110

Arg Gln Arg Arg Ala Lys Ala Asn Gly Thr Ile Ser Lys Lys Cys Val

115 120 125

Lys Gln Thr Thr Ala Gln Asn Gly Ser Val Ser Lys Arg Ala Lys Glu

130 135 140

Ile Gly Val Ile Lys Arg His Leu Pro Gly Cys Glu Lys Asp Val Leu

145 150 155 160

Cys Ile Gly Ile Lys Asn Lys Glu Ala Lys Phe Ser Asn Arg Thr Lys

165 170 175

Ser Glu Gly Trp Leu Thr Pro Thr Ala Asn Gln Leu Leu Gln Thr His

180 185 190

Ile Asn Leu Val Lys Lys Ile Arg Lys Phe Leu Pro Ile Ser Asp Val

195 200 205

Val Leu Glu Ile Asn Lys Phe Ala Phe Met Gln Leu Asp Asn Pro Asn

210 215 220

Val Gln Lys Trp Gln Tyr Gln Gln Gly Pro Leu Tyr Gln Lys Ala Asn

225 230 235 240

Leu Glu Glu Ala Val Ser Glu Met Gln Glu His His Cys Leu Phe Cys

245 250 255

Lys Lys Pro Ile Ala His Tyr His His Val Val Pro Gln Ser Glu Asn

260 265 270

Gly Ser Asn Thr Ile Gly Asn Ile Val Gly Leu Cys Thr Lys His His

275 280 285

Asp Leu Val His Lys Asp Thr Ala Trp Gln Lys Lys Leu Ala Lys Lys

290 295 300

Lys Thr Gly Leu Asn Lys Lys Tyr Gly Ala Leu Ser Val Leu Asn Gln

305 310 315 320

Ile Ile Pro Ala Leu Thr Lys Glu Leu Gly Ser Leu Phe Pro Lys His

325 330 335

Phe Phe Ala Thr Asn Gly Lys Ser Thr Tyr Asp Tyr Arg Ala Ala His

340 345 350

Gly Val Arg Lys Asp His Trp Leu Asp Ala Tyr Cys Ile Ala Cys Ser

355 360 365

Val Leu Pro Asn Asp Val Cys Asp Lys Asn Ile Asn Ser Arg Val Leu

370 375 380

Tyr Glu Leu Lys Gln Phe Arg Arg His Asp Arg Arg Ala Leu Asn Asn

385 390 395 400

Glu Asn Met Ser Arg Val Tyr Thr Leu Asn Glu Asn Val Val Ala Thr

405 410 415

Asn Arg His Lys Ala Thr Lys Gln Thr Thr Asp Ser Leu Glu Glu Phe

420 425 430

Arg Gln Asn His Pro Asp Asp Ala Cys Lys Leu Lys Val Lys Glu His

435 440 445

His Pro Thr Tyr Arg Asn Met Ser Arg Asn Tyr Pro Gly Ser Val Phe

450 455 460

Leu Val Gly Asn Gln Val His Val Met Gln Gly Val Ala Gly Ser Lys

465 470 475 480

Asp Gly Lys Ala Thr Thr Tyr Lys Asp Thr Asn Ala Asn Ser Ile Ala

485 490 495

Ala Gly Lys Cys Lys Phe Val Ala Lys Asn Ser Gly Ile Leu Phe Val

500 505 510

<210> 629

<211> 419

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-526 effector

<400> 629

Met Val Tyr Val Ile Ser Gln Asp Ser Lys Pro Leu Met Pro Cys Ser

1 5 10 15

Asn Pro Ile Ala Arg Leu Leu Leu Lys Gln Gly Lys Ala Lys Val Lys

20 25 30

Arg Arg Glu Pro Phe Thr Ile Lys Leu Ile Tyr Glu Thr Thr Asp Tyr
35 40 45
Thr Gln Asp Leu Thr Leu Gly Val Asp Thr Gly Ser Gly Thr Ile Gly
50 55 60
Ala Ala Val Ser Lys Asp Asn Gly Asp Ile Val Tyr Met Ser Glu Val
65 70 75 80
Val Val Arg Asn Asp Ile Thr Asp Lys Met Thr Gln Arg Ala Lys Tyr
85 90 95

Arg Arg Asn Arg Arg Asn Arg Lys Thr Arg Tyr Arg Lys Ala Arg Trp
100 105 110
Leu Asn Arg Ser Asn Ser Ile Lys Lys Asp Arg Phe Ser Pro Thr Met
115 120 125
Gln Ser Lys Leu His Ser His Val Lys Glu Ile Glu Tyr Ile Gln Ser
130 135 140
Ile Leu Pro Ile Thr Glu Met Val Phe Glu Thr Gly Gln Phe Asp Met
145 150 155 160

His Leu Met Lys Asp Pro Ser Leu Ala Asn Pro Lys Val Arg Pro Trp
165 170 175
Gly Tyr Gln Lys Gly Thr Asn Tyr Gly Phe Glu Asn Thr Lys Ala Met
180 185 190
Val Leu Asn Arg Asp Asn Tyr Thr Cys Gln Cys Cys Lys Gly Lys His
195 200 205
Lys Asp Ser Lys Leu Glu Val His His Ile Val Phe Arg Ser Gln Gly
210 215 220

Gly Ser Asp Glu Glu Ser Asn Leu Ile Thr Leu Cys His Thr Cys His
225 230 235 240
Lys Asn Leu His Ser Gly Lys Ile Asn Leu Lys Leu Ser Gly Lys Val
245 250 255
Lys Gly Asn Leu Lys Tyr Ala Thr Gln Met Asn Ser Ile Arg Lys Gln
260 265 270

Leu Phe Arg Leu Tyr Pro Asn Ala Ile Glu Thr Phe Gly Tyr Val Thr
275 280 285

Lys Ala Asn Arg Leu His Leu Gly Val Asp Lys Glu His Tyr Tyr Asp
290 295 300
Ala Cys Thr Ile Ala Thr Gln Gly Asn Thr Phe Asn Val Lys Ser Asn
305 310 315 320
Leu Tyr Lys Lys Lys Cys Val Ser Asp Gly Asp Phe Gln Lys Thr Lys
325 330 335
Gly Ile Cys Ser Glu Gln Pro Ile Val Thr Asp Lys Ile Cys Ser Phe
340 345 350

Arg Lys Phe Asp Lys Val Arg Tyr Phe Gly Lys Asp Tyr Phe Ile Lys
355 360 365
Gly Arg Met Ser Thr Gly Tyr Ala Ile Leu Met Asp Ile Asp Gly Asn
370 375 380
Lys Ile Asp Phe Ser Thr Met Pro Arg Gly Tyr Lys Thr Pro Lys Leu
385 390 395 400
Ser Asn Cys Lys Arg Ile Thr Ala Arg Ser Thr Val Met Thr Gln Val
405 410 415

Lys Val Val

<210> 630
<211> 419
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-527 effector
<400> 630
Met Val Tyr Val Ile Ser Gln Asp Ser Lys Pro Leu Met Pro Cys Ser
1 5 10 15
Asn Pro Ile Ala Arg Leu Leu Leu Lys Gln Gly Lys Ala Lys Val Lys

20 25 30

Arg Arg Glu Pro Phe Thr Ile Lys Leu Ile Tyr Glu Thr Thr Asp Tyr

35 40 45

Thr Gln Asp Leu Thr Leu Gly Val Asp Thr Gly Ser Gly Thr Ile Gly

50 55 60

Ala Ala Val Ser Lys Asp Asn Gly Asp Ile Val Tyr Met Ser Glu Val

65 70 75 80

Val Val Arg Asn Asp Ile Thr Asp Lys Met Thr Gln Arg Ala Lys Tyr

85 90 95

Arg Arg Asn Arg Arg Asn Arg Lys Thr Arg Tyr Arg Lys Ala Arg Trp

100 105 110

Leu Asn Arg Ser Asn Ser Ile Lys Lys Asp Arg Phe Ser Pro Thr Met

115 120 125

Gln Ser Lys Leu His Ser His Val Lys Glu Ile Glu Tyr Ile Gln Ser

130 135 140

Ile Leu Pro Ile Thr Glu Met Val Phe Glu Thr Gly Gln Phe Asp Met

145 150 155 160

His Leu Met Lys Asn Pro Ser Leu Ala Asn Pro Lys Val Arg Pro Trp

165 170 175

Gly Tyr Gln Lys Gly Thr Asn Tyr Gly Phe Glu Asn Thr Lys Ala Met

180 185 190

Val Leu Asn Arg Asp Asn Tyr Thr Cys Gln Cys Cys Lys Gly Lys His

195 200 205

Lys Asp Ser Lys Leu Glu Val His His Ile Val Phe Arg Ser Gln Gly

210 215 220

Gly Ser Asp Glu Glu Ser Asn Leu Ile Thr Leu Cys His Thr Cys His

225 230 235 240

Lys Asp Leu His Ser Gly Lys Ile Asn Leu Lys Leu Ser Gly Lys Val

245 250 255

Lys Gly Asn Leu Lys Tyr Ala Thr Gln Met Asn Ser Ile Arg Lys Gln

260 265 270

Leu Phe Arg Leu Tyr Pro Asn Ala Ile Glu Thr Phe Gly Tyr Val Thr
275 280 285
Lys Ala Asn Arg Leu His Leu Gly Val Asp Lys Glu His Tyr Tyr Asp

290 295 300
Ala Cys Thr Ile Ala Thr Gln Gly Asn Ala Phe Asn Val Lys Ser Asp
305 310 315 320
Leu Tyr Lys Lys Lys Cys Val Ser Asp Gly Asp Phe Gln Lys Thr Lys
325 330 335
Gly Ile Arg Ser Glu Gln Pro Ile Val Thr Asp Lys Ile Cys Gly Phe
340 345 350
Arg Lys Phe Asp Lys Val Arg Tyr Phe Gly Lys Asp Tyr Phe Ile Lys

355 360 365
Gly Arg Met Ser Thr Gly Tyr Ala Ile Leu Met Asp Ile Asp Gly Asn
370 375 380
Lys Ile Asp Phe Ser Thr Met Pro Arg Gly Tyr Lys Thr Pro Lys Leu
385 390 395 400
Ser Asn Cys Lys Arg Ile Thr Ala Arg Ser Thr Val Met Thr Gln Val
405 410 415
Lys Val Val

<210> 631
<211> 482

<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-528 effector
<400> 631
Met Gln Glu Glu Asp Thr Gln Gln Leu Glu Arg Arg Asn Thr Tyr Thr
1 5 10 15
Ser Thr Gly Ala Ala Pro Ala Arg Ser Asn Cys Asp Pro Ser Leu Lys

20 25 30

Ala Ala Arg Gly Ser Cys Gly Val Ala Asp Leu Lys Thr Phe Ser Asn

35 40 45

Asn Ser Glu Glu Gln Lys Thr Arg Glu Gln Val Glu His Ser Ile Leu

50 55 60

Val Phe Val Leu Asn Lys His Gly Lys Gln Leu Met Pro Cys Thr Ala

65 70 75 80

Gly Lys Ala Arg Arg Leu Leu Lys Gln Gly Lys Ala Lys Ile Val Ser

85 90 95

Leu Thr Pro Phe Thr Ile Gln Leu Pro Tyr Gly Ser Ser Gly Tyr Lys

100 105 110

Gln Asp Ile Thr Leu Gly Ile Asp Ala Gly Tyr Lys Thr Val Gly Tyr

115 120 125

Ser Ala Val Thr Ala Ser Arg Glu Leu Ile Ala Gly Glu Leu Glu Leu

130 135 140

Arg Thr Asp Ile Lys Arg Leu Leu Glu Lys Arg Arg Ala Tyr Arg Arg

145 150 155 160

Asp Arg Arg Asn Arg Lys Trp His Arg Lys Pro Arg Phe Val Asn Arg

165 170 175

Gly Arg Lys Asn Gly Trp Leu Ala Pro Ser Leu Glu His Lys Leu Gln

180 185 190

Ser His Ala Lys Leu Ile Glu Arg Leu Lys Gln Ile Leu Pro Ile Thr

195 200 205

Lys Ile Ile Val Glu Val Ala Ser Ser Asp Thr Gln Lys Met Gln Arg

210 215 220

Pro Glu Ile Ser Gly Val Glu Tyr Gln Gln Gly Glu Leu Gln Gly Tyr

225 230 235 240

Glu Val Arg Glu Tyr Leu Leu Glu Lys Tyr His Arg Lys Cys Ala Tyr

245 250 255

Cys Gly Lys Thr Asp Val Pro Leu Glu Ile Glu His Ile Ile Pro Lys

260 265 270

Ser Arg Gly Gly Ser Asp Arg Val Ser Asn Leu Thr Ile Ser Cys His

275 280 285

Glu Cys Asn Gln Glu Lys Gly Asn Arg Thr Ala Glu Glu Phe Gly Tyr

290 295 300

Pro Glu Ile Gln Lys Gln Ala Lys Gln Ser Leu Lys Ala Thr Ala Phe

305 310 315 320

Met Asn Ile Ile Arg Trp Lys Leu Val Asn Met Leu Gly Cys Gly Trp

325 330 335

Thr Tyr Gly Ser Ile Thr Lys Tyr Trp Arg Thr Lys Leu Gly Ile Glu

340 345 350

Lys Ser His Val Asn Asp Ala Phe Val Ile Ala Gly Gly Thr Gly Gln

355 360 365

Glu Arg Ala Gly Tyr Val Tyr Lys Gly Lys Gln Val Arg Arg Gln Asn

370 375 380

Arg Ser Leu Phe Lys Ala Asn Leu Leu Lys Gly Gly Arg Arg Lys Arg

385 390 395 400

Asn Thr Val Lys Glu Val Lys Gly Phe Arg Arg Phe Asp Lys Val Met

405 410 415

Tyr Gly Lys Ala Lys Cys Tyr Ile Phe Gly Leu Arg Ser Ser Gly His

420 425 430

Phe Asn Leu Lys Thr Ile Asp Gly Glu Lys Val Ser Asp Ser Val Ser

435 440 445

Tyr Lys Lys Leu Thr Leu Val Glu Arg Ala Arg Gly Arg Ile Glu Glu

450 455 460

Val Arg Arg Ala Ile Pro Ser Arg Ala Glu Ala Arg Gly Ile Leu Ala

465 470 475 480

His Val

<210> 632

<211> 394

<212

> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-529 effector

<400> 632

Met Pro Asp Gln Ile Lys Val Phe Val Val Asp Ala Lys Gly Lys Pro
1 5 10 15

Leu Leu Pro Thr Thr Pro Ala Arg Ala Arg Leu Leu Leu Lys Arg Asn
20 25 30

Lys Ala Lys Leu Tyr Arg Met Ile Pro Phe Thr Val Gln Leu Asn Arg

35 40 45

Val Val Asn Asn Pro Ala Gly Glu Phe Ser Val Ala Ile Asp Asp Gly
50 55 60

Ala Lys Trp Ile Gly Ile Ala Val Lys Gly Arg Asp Glu Val Val Phe
65 70 75 80

Ala Val Asn Val Lys Leu Arg Gln Asp Val Ser Arg Arg Val Lys Glu
85 90 95

Arg Ala Met Tyr Arg Arg Asn Arg Arg Asn Arg Leu Arg Tyr Arg Pro

100 105 110

Ala Arg Phe Leu Asn Arg Lys Arg Glu Arg Trp Leu Pro Pro Ser Ile
115 120 125

Arg Tyr Arg Lys Glu Val Val Leu Arg Val Leu Asn Asp Leu Arg Lys
130 135 140

Phe Leu Asn Ile Thr Lys Val Leu Ile Glu Gln Val Thr Phe Asp Ile
145 150 155 160

Ser Ser Met Val Ala Gly Arg Lys Leu Thr Gly Lys Glu Tyr Gln Gln

165 170 175

Lys Ile His Glu Gly Lys Asn Phe Arg Glu Lys Val Leu Lys Arg Asp
180 185 190

Gly Tyr Thr Cys Gln Ile Cys Gly Ser Lys Glu Asn Leu Glu Ala His
195 200 205

His Ile Ile Pro Lys Ser Arg Gly Gly Thr Asn Ile Val Glu Asn Gly
210 215 220
Ile Thr Leu Cys Lys Glu Cys His Lys Ala Val His Glu Gly Lys Ile

225 230 235 240
Arg Leu Thr Ala Asn Leu Leu Pro Phe Arg His Ala Ala Ile Val Gln
245 250 255
Gln Gly Lys Trp Trp Leu Tyr Arg Lys Leu Lys Glu Gln Phe Asp Lys
260 265 270
Val Gln Ile Thr Phe Gly His Leu Thr Glu Lys Lys Arg Glu Glu Leu
275 280 285
Gln Leu Pro Lys Ala His His Thr Asp Ala Cys Ala Met Leu Asn Cys

290 295 300
Asn Lys Ile Val Ser Pro Val Tyr Leu Ile Ile Pro Arg Arg Arg Arg
305 310 315 320
Pro Glu Ile Asn Asn Pro Thr Arg Lys Asn Asp Glu Tyr Arg Gly Phe
325 330 335
Arg His Phe Asp Leu Val Ile Ala Tyr His Lys Thr Lys Gly Lys Val
340 345 350
Ile Gly Cys Val Arg Ser Leu Lys Lys Arg Gly Leu Ala Leu Arg Thr

355 360 365
Lys Phe Ser Asp Asn Phe Val Val Gly Tyr Thr Lys Ser Arg Leu Leu
370 375 380
Trp Arg Pro Lys Gly Leu Val Tyr Val Met
385 390
<210> 633
<211> 420
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-530 effector

<400> 633

Met Gln Tyr Val Tyr Val Leu His Lys His Gly Glu Pro Leu Met Pro

1 5 10 15

Cys Ser Pro Gly Lys Ala Arg Leu Leu Leu Lys Gln Gln Lys Ala Cys

20 25 30

Val Val Lys Arg Thr Pro Phe Thr Ile Lys Leu Leu Tyr Gly Ser Val

35 40 45

Gly Tyr Lys Gln Pro Ile Thr Leu Gly Val Asp Ala Gly Ser Lys His

50 55 60

Val Gly Leu Ser Ala Ser Thr Glu Lys Arg Glu Leu Tyr Ser Glu Glu

65 70 75 80

Phe Thr Pro Arg Asn Asp Val Val Glu Leu Leu Ser Thr Arg Arg Gln

85 90 95

Asn Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg Ala Pro Arg

100 105 110

Phe Asp Asn Arg Val His Ser Lys His Lys Gly Trp Leu Ala Pro Ser

115 120 125

Val Glu Val Lys Ile Gln Glu His Ile Thr Val Ile Lys Arg Ile Cys

130 135 140

Arg Ile Leu Pro Ile Thr Leu Val Arg Val Glu Thr Ala Glu Phe Asp

145 150 155 160

Thr Gln Arg Leu Lys Ala Met Leu Ala Gly Lys Pro Leu Pro Val Gly

165 170 175

Thr Asp Tyr Gln Leu Gly Glu Met Tyr Asp Glu Tyr Asn Val Arg Gln

180 185 190

Tyr Val Leu Lys Leu Asp Asn Tyr Thr Cys Gln Cys Cys Gly Ala His

195 200 205

Pro Thr Thr Lys Lys Pro Val Lys Leu His Val His His Leu Glu Ser

210 215 220

Arg Lys Val Gly Gly Asn Ala Pro Ser Asn Leu Ile Thr Leu Cys Thr

225 230 235 240

Ala Cys His Asp Asn Leu His Lys Gly Lys Val Thr Leu Asp Gly Lys
245 250 255
Glu Arg Gly Lys Thr Leu Arg Asp Ala Ala Phe Met Gly Ile Met Arg

260 265 270
Lys Thr Leu Met Ala Arg Leu Lys Glu Arg Leu Pro Ile Pro Val Gln
275 280 285
Gly Thr Tyr Gly Tyr Ile Thr Lys Met Arg Arg Glu Gln Asn Asp Ile
290 295 300
Lys Lys Ser His Val Asn Asp Ala Arg Cys Ile Ser Lys His Pro Leu
305 310 315 320
Ala Glu Pro Cys Ser Val Cys Tyr Arg Thr Lys Ala Ile Arg His His

325 330 335
Asn Arg Gln Thr His Lys Val Asn Phe Ser Lys Gly Gly Phe Arg Lys
340 345 350
Arg Ser Gln Met Pro Tyr Ile Val Lys Asp Tyr Arg Leu Trp Asp Lys
355 360 365
Val Leu Tyr Lys Gly Gln Glu Cys Phe Val Ser Ser Arg Arg Ala Ser
370 375 380
Gly Ser Phe Ala Leu Lys Lys Leu Asp Gly Thr Ser Ile Ser Lys Gly

385 390 395 400
Val Thr Phe Lys Lys Leu Trp Leu Leu Glu Pro Ala Thr Asn Tyr Leu
405 410 415
Ile Glu Arg Met
420

<210> 634
<211> 421
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-531 effector

<400> 634

Met Val Tyr Val Ile Ser Ile Ser Gly Arg Pro Leu Met Pro Thr Ala

1 5 10 15

His Cys Gly Lys Val Lys His Leu Leu Lys Asp Gly Lys Ala Lys Val

20 25 30

Val His Arg Glu Pro Phe Thr Ile Gln Leu Leu Tyr Glu Thr Thr Glu

35 40 45

Tyr Thr Gln Thr Thr Thr Leu Gly Val Asp Thr Gly Ser Gly Thr Phe

50 55 60

Gly Ala Ala Val Val Thr Asp Glu Ser His Lys Val Leu Tyr Met Ser

65 70 75 80

Glu Val Glu Val Arg Asn Asp Ile Ser Lys Lys Met Lys Gln Arg Ser

85 90 95

Lys Tyr Arg His Asn Arg Arg Asn Arg Lys Thr Arg Tyr Arg Lys Val

100 105 110

Arg Phe Asp Asn Arg Lys Asn Ser Ile Lys Asp Asn Arg Phe Ser Pro

115 120 125

Thr Met Gln Ser Lys Ile Asn Ala His Glu Arg Glu Ile Lys Phe Ile

130 135 140

Lys Ser Ile Leu Pro Val Thr His Leu Val Leu Glu Thr Gly Thr Phe

145 150 155 160

Asp Met Ala Leu Met Asn Asn Pro Ala Leu Ala Asn Pro Lys Ile Ala

165 170 175

Arg Trp Gly Tyr Gln Arg Gly Pro Asn Tyr Gly Phe Ala Asn Thr Lys

180 185 190

Ala Met Val Lys Ala Arg Asp Gly Tyr Thr Cys Ala Leu Cys Lys Gly

195 200 205

Lys His Lys Asp Arg Arg Leu Asp Val His His Ile Ile Phe Arg Ser

210 215 220

His Gly Gly Ser Asp Lys Ala Glu Asn Leu Ile Thr Leu Cys His Thr

225 230 235 240

Cys His Lys Lys Leu His Asp Gly Glu Ile Ile Tyr Ser Gly Lys Gly
245 250 255
Lys Arg Lys Gly Ser Leu Ser Phe Ala Thr Gln Met Asn Ser Ile Arg

260 265 270
Lys Gln Leu Leu Ala Arg His Pro Glu Ala Ile Glu Thr Phe Gly Tyr
275 280 285
Ile Thr Ser Glu Asn Cys Gln Leu Tyr Gly Leu Pro Lys Ala His Cys
290 295 300
Ile Asp Ala Ala Val Ile Ala Ser Asp Val Tyr Lys Pro Ile Phe Ala
305 310 315 320
Thr Gln Asp Val Phe Tyr Lys Arg Cys Ile Ala Lys Gly Thr Tyr Gln

325 330 335
Cys Thr Lys Gly Val Arg Ser Glu Lys Ser Met Pro Lys Thr Lys Ile
340 345 350
Glu Gly Phe Lys Gln Phe Asp Lys Val Lys Tyr Gln Asn Gly Leu Tyr
355 360 365
Phe Ile Lys Gly Arg Met Ser Ser Gly Tyr Ala Val Leu Ser Asp Ile
370 375 380
Tyr Gly Thr Lys Ile Asp Phe Pro His Val Pro Lys Leu Arg Glu Met

385 390 395 400
Gln Arg Ile Ala Ala Arg Lys Ser Ile Ile Tyr Ile Thr Ala Lys Ile
405 410 415
Asp Leu Lys Val Ser
420

<210> 635
<211> 568
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-532 effector

<400> 635

Met Tyr His Arg His Leu Asp Val Cys Cys Ala Cys Arg Phe Ser Gln

1 5 10 15

Leu Ile Ala Pro His Glu Trp His Cys Leu Val Gln Tyr Arg Ser Gln

20 25 30

Gln Thr Pro Ser Gln Gly Lys His Asn Leu Leu Phe Gln Gln Glu Arg

35 40 45

Phe Ile Ile Lys Glu Val Ala Tyr Met Ser Thr Val Tyr Val Leu Asn

50 55 60

Lys Asp Gly Lys Pro Leu Met Pro Thr Thr Arg Gly Gly His Val Arg

65 70 75 80

Tyr Leu Leu Lys Glu Lys Lys Ala Arg Val Val Ala Ser Lys Pro Phe

85 90 95

Thr Ile Gln Leu Leu Tyr Glu Thr Asp Asp Val Val Gln Pro Leu Tyr

100 105 110

Leu Gly Ile Asp Pro Gly Arg Ser Asn Ile Gly Val Ala Val Val Lys

115 120 125

Thr Asp Gly Met Ala Val Phe Thr Ala His Leu Glu Thr Arg Asn Lys

130 135 140

Glu Ile Pro Lys Leu Met Lys Lys Arg Lys Asp Ser Arg Arg Ala Arg

145 150 155 160

Arg Thr Asn Gly Arg Arg Cys Arg Arg Gln Arg Arg Ala Lys Ala Asn

165 170 175

Gly Thr Ile Ser Lys Lys Cys Val Lys Gln Thr Thr Ala Gln Asn Gly

180 185 190

Ser Val Ser Lys Arg Ala Lys Glu Ile Gly Val Ile Lys Arg His Leu

195 200 205

Pro Gly Cys Glu Lys Asp Val Leu Cys Ile Gly Ile Lys Asn Lys Glu

210 215 220

Ala Lys Phe Asn Asn Arg Thr Arg Pro Thr Gly Trp Leu Thr Pro Thr

225 230 235 240

Ala Asn Gln Leu Leu Gln Thr His Ile Asn Leu Val Lys Lys Ile Gln
245 250 255
Lys Phe Leu Pro Ile Ser Asp Val Val Leu Glu Val Asn Lys Phe Ala

260 265 270
Phe Met Gln Leu Asp Asn Pro Asn Ile Gln Lys Arg Gln Tyr Gln His
275 280 285
Gly Pro Leu Tyr Gln Lys Glu Ser Leu Glu Ser Ala Val Ser Glu Met
290 295 300
Gln Glu His His Cys Leu Phe Cys Lys Lys Pro Ile Asp His Tyr His
305 310 315 320
His Val Val Pro Gln His Lys Asn Gly Ser Asn Thr Ile Asp Asn Ile

325 330 335
Val Gly Leu Cys Thr Lys His His Asp Leu Val His Lys Asp Thr Thr
340 345 350
Trp Gln Lys Lys Leu Ala Lys Lys Lys Thr Gly Leu Asn Lys Arg Tyr
355 360 365
Gly Ala Leu Ser Ile Leu Asn Gln Ile Ile Pro Ala Leu Thr Lys Glu
370 375 380
Leu Ser Ser Leu Phe Pro Lys His Phe Phe Val Thr Asn Gly Lys Ser

385 390 395 400
Thr Tyr Asp Tyr Arg Ala Ala His Gly Val Ser Lys Asp His Trp Leu
405 410 415
Asp Ala Tyr Cys Ile Ala Cys Ser Val Leu Pro Asn Asp Ile Cys Asp
420 425 430
Asn Ser Ile Asn Asn Arg Val Pro Tyr Glu Leu Lys Gln Phe Arg Arg
435 440 445
His Asp Arg Arg Ala Leu His Lys Ala Asn Met Ser Arg Val Tyr Thr

450 455 460
Leu Asn Gly Lys Lys Val Ala Thr Asn Arg His Lys Ala Val Glu Gln
465 470 475 480
Thr Thr Asp Ser Leu Glu Glu Phe Arg Gln Asn His Pro Asp Asn Val

485 490 495

Cys Lys Leu Lys Val Lys Glu His His Pro Thr Tyr Arg Asn Met Ser

500 505 510

Arg Asn Tyr Pro Gly Ser Val Phe Phe Val Asn Lys Gln Ile His Val

515 520 525

Met Gln Gly Thr Ser Gly Ser His Asn Gly Lys Thr His Gly Tyr Tyr

530 535 540

Asp Thr Asn Gly Asn Ser Tyr Pro Ser Ser Lys Cys Lys Phe Val Ala

545 550 555 560

Lys Asn Ser Gly Ile Val Phe Ala

565

<210> 636

<211> 512

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-533 effector

<400> 636

Met Ser Thr Ile Tyr Val Leu Asn Lys Asp Gly Lys Pro Leu Met Pro

1 5 10 15

Thr Thr Arg Cys Gly His Val Arg Arg Leu Leu Lys Glu Gln Lys Ala

20 25 30

Arg Ala Val Ala Ser Lys Pro Phe Thr Ile Gln Leu Leu Tyr Glu Thr

35 40 45

Asp Asn Ile Val Gln Pro Leu Tyr Leu Gly Ile Asp Pro Gly Arg Thr

50 55 60

Asn Ile Gly Val Ala Val Val Lys Ala Asp Gly Thr Ala Val Phe Thr

65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Glu Ile Pro Lys Leu Met Lys Lys

85 90 95

Arg Lys Asp Ser Arg Arg Ala Arg Arg Thr Asn Gly Arg Arg Cys Arg
100 105 110
Arg Gln Arg Arg Ala Lys Ala Asn Gly Thr Ile Ser Lys Lys Cys Val

115 120 125
Lys Gln Ala Thr Ala Gln Asn Gly Ser Ala Ser Lys Arg Ala Lys Lys
130 135 140
Ile Gly Val Ile Lys Arg His Leu Pro Asp Cys Glu Lys Glu Val Leu
145 150 155 160
Cys Ile Gly Ile Lys Asn Lys Glu Ala Lys Phe Asn Asn Arg Ala Arg
165 170 175
Pro Glu Gly Trp Leu Thr Pro Thr Ala Asn Gln Leu Leu Gln Thr His

180 185 190
Val Asn Leu Val Lys Lys Ile Gln Lys Phe Leu Pro Ile Ser Asp Ile
195 200 205
Val Leu Glu Val Asn Lys Phe Ala Phe Met Gln Leu Asp Asn Pro Asn
210 215 220
Ile Gln Lys Trp Gln Tyr Gln Gln Gly Pro Leu Tyr Gln Lys Ala Asn
225 230 235 240
Leu Glu Glu Ala Val Ser Glu Met Gln Glu His His Cys Leu Phe Cys

245 250 255
Lys Lys Pro Ile Glu His Tyr His His Val Val Pro Gln His Lys Asn
260 265 270
Gly Gly Asn Thr Ile Ser Asn Ile Val Gly Leu Cys Thr Lys His His
275 280 285
Asp Leu Val His Lys Asp Thr Glu Trp His Glu Lys Leu Thr Lys Lys
290 295 300
Lys Thr Gly Leu Asn Lys Lys Tyr Gly Ala Leu Ser Val Leu Asn Gln

305 310 315 320
Ile Ile Pro Ala Leu Thr Lys Glu Leu Ser Ser Ile Phe Pro Lys His
325 330 335
Phe Phe Val Ala Thr Gly Lys Ser Thr Tyr Asp Tyr Arg Ala Ala His

340 345 350

Gly Val Ser Lys Asp His Trp Leu Asp Ala Tyr Cys Ile Ala Cys Ser

355 360 365

Val Leu Pro Asn Asp Ala Cys Asp Ser Ser Ile Asn Asn Arg Val Pro

370 375 380

Tyr Glu Leu Lys Gln Phe Arg Arg His Asp Arg Arg Ala Leu His Lys

385 390 395 400

Glu Asn Met Ser Arg Val Tyr Thr Leu Asn Gly Lys Lys Val Ala Thr

405 410 415

Asn Arg His Lys Ala Ile Glu Gln Thr Thr Asp Ser Leu Glu Glu Phe

420 425 430

Arg Gln Asn Asn Leu Asp Asn Val Cys Lys Leu Lys Val Lys Glu His

435 440 445

His Pro Glu Tyr Arg Asn Pro Lys Arg Asn Phe Pro Gly Cys Val Phe

450 455 460

Leu Val Gly Lys Gln Thr His Val Met Gln Gly Thr Ser Gly Ser His

465 470 475 480

Asn Gly Lys Ala Asp Gly Tyr Tyr Asp Thr Asn Gly Asn Ser Tyr Ser

485 490 495

Ser Gly Lys Cys Lys Phe Val Ala Lys Asn Glu Gly Ile Ile Phe Thr

500 505 510

<210> 637

<211> 399

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-534 effector

<400> 637

Met Thr His Tyr Glu Arg Arg His Leu Met Pro Asp Thr Asn Tyr Ile

1 5 10 15

Tyr Val Leu Gly Thr Asp Gly Lys Pro Gln Met Pro Thr Lys Arg Lys
20 25 30

Arg His Val Lys Arg Leu Leu Asn Thr Gly Lys Ala Arg Ile Ala Cys
35 40 45
His Val Pro Tyr Thr Ile Gln Leu Leu Tyr Lys Asn Glu Pro Val Leu
50 55 60
Gln Pro Val Met Leu Ala Glu Asp Pro Gly Arg Thr Asn Ile Gly Leu
65 70 75 80
Ala Val Leu Ser Arg Lys Gly Glu Leu Leu Leu Ser Ala Val Ile Glu
85 90 95

Thr Arg Asn Arg Glu Ile Val Lys Leu Met Ala Asp Arg Lys Lys Ala
100 105 110
Arg Arg Ala Ser Arg Asn Gly Glu Arg Lys Ala Arg Gln Arg Leu Ala
115 120 125
Lys Arg Phe Asp Thr Met Phe Glu Ala Gly Met Leu Met Arg Lys Leu
130 135 140
Pro Met Tyr Ala Ala Asp Lys Phe Val Thr Cys Asn Tyr Ile Lys Asn
145 150 155 160

Thr Glu Ser Arg Phe Cys Asn Arg Lys Arg Ser Asp Gly Trp Leu Thr
165 170 175
Pro Thr Ala Asn Gln Leu Leu Glu Thr His Ile Asn Leu Ile His Lys
180 185 190
Ile Gln Lys Tyr Leu Pro Val Thr Asp Val Ala Ile Glu Val Asn Arg
195 200 205
Phe Ala Phe Met Thr Leu Glu Asn Pro Ala Ile Ser Gly Val Asp Phe
210 215 220

Gln Asn Gly Pro Leu Lys Gly Phe Asp Ser Leu His Asp Ala Val Asp
225 230 235 240
Asp Leu Gln His Gly Lys Cys Leu Leu Cys Gly Gly Lys Ile Glu His
245 250 255
Tyr His His Ile Val Pro Arg Ser Gln Arg Gly Ser Asn Thr Ile Gly

260 265 270

Asn Ile Ala Gly Leu Cys Met Glu Cys His Gly Lys Val His Lys Asp

275 280 285

Ile Glu Tyr Gln Lys Glu Leu Lys Asp Leu Lys Lys Gly Leu Asp Lys

290 295 300

Arg Tyr Gly Ala Leu Ser Ala Leu Asn Gln Ala Met Pro Phe Ile Cys

305 310 315 320

Lys Ser Leu Glu Ser Glu Phe Gly Lys Ala His Val Ser Tyr Cys Thr

325 330 335

Gly Arg Asp Thr Ala Lys Met Arg Asn Ser Phe Gly Phe Gln Lys Thr

340 345 350

Lys Glu Asn Gln Leu His Glu Val Asp Ala Trp Cys Ile Gly Ile Leu

355 360 365

Ala Arg Asn Ser Ala Pro Asn Arg Leu Pro Asn Phe Glu Gln Thr His

370 375 380

Tyr Ile Arg Gln Phe Arg Arg Gln Asp Arg Ser Leu Ile Arg Cys

385 390 395

<210> 638

<211> 512

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220

><223> Category: MG35 effectors

<220><223> Description: MG35-535 effector

<400> 638

Met Ser Thr Val Tyr Val Leu Asn Lys Asn Gly Lys Pro Leu Met Pro

1 5 10 15

Thr Thr Arg Cys Gly His Val Arg Arg Leu Leu Lys Glu Gln Lys Ala

20 25 30

Arg Ala Val Ala Ser Lys Pro Phe Thr Ile Gln Leu Leu Tyr Glu Thr

35 40 45

Asp Asp Val Val Gln Pro Leu Tyr Leu Gly Ile Asp Pro Gly Arg Thr

50 55 60

Asn Ile Gly Val Ala Val Val Lys Thr Asp Gly Thr Ala Val Phe Thr

65 70 75 80

Ala His Leu Glu Thr Arg Asn Lys Glu Ile Pro Lys Leu Met Lys Lys

85 90 95

Arg Lys Asp Ser Arg Arg Ala Arg Arg Thr Asn Gly Arg Arg Cys Arg

100 105 110

Arg Gln Arg Arg Ala Lys Ala Asn Gly Thr Leu Ser Lys Lys Cys Val

115 120 125

Lys Gln Thr Thr Ala Gln Asn Gly Ser Val Ser Lys Arg Ala Lys Lys

130 135 140

Ile Gly Val Ile Lys Arg His Leu Pro Gly Cys Glu Lys Glu Ala Leu

145 150 155 160

Cys Ile Gly Ile Lys Asn Lys Glu Ala Lys Phe Asn Asn Arg Thr Arg

165 170 175

Pro Glu Gly Trp Leu Thr Pro Thr Ala Asn Gln Leu Leu Gln Thr His

180 185 190

Ile Asn Leu Val Lys Lys Ile Gln Lys Phe Leu Pro Ile Ser Asp Val

195 200 205

Val Leu Glu Val Asn Lys Phe Ala Phe Met Arg Leu Asp Asn Pro Asn

210 215 220

Ile Gln Lys Trp Gln Tyr Gln Gln Gly Pro Leu Tyr Gln Lys Ala Ser

225 230 235 240

Leu Glu Glu Ala Val Ser Glu Met Gln Glu His His Cys Leu Phe Cys

245 250 255

Lys Asn Thr Ile Asp His Tyr His His Val Val Pro Gln His Lys Asn

260 265 270

Gly Ser Asn Thr Ile Asp Asn Ile Val Gly Leu Cys Thr Lys His His

275 280 285

Asp Leu Val His Lys Glu Thr Ala Trp Gln Glu Lys Leu Ala Lys Lys

290 295 300

Lys Thr Gly Leu Asn Lys Lys Tyr Gly Ala Leu Ser Val Leu Asn Gln

305 310 315 320

Ile Ile Leu Ala Leu Thr Lys Gly Leu Ser Phe Leu Phe Pro Lys His

325 330 335

Phe Phe Val Thr Thr Gly Lys Asn Thr Tyr Asp Tyr Arg Thr Ala His

340 345 350

Ser Val Ser Lys Asp His Trp Leu Asp Ala Tyr Cys Ile Ala Cys Ser

355 360 365

Val Leu Pro Asn Asp Val Cys Asp Ser Ser Ile Asn Ser His Val Pro

370 375 380

Tyr Glu Leu Lys Gln Phe Arg Arg His Asp Arg Arg Ala Leu His Lys

385 390 395 400

Glu Asn Met Ser Arg Val Tyr Thr Leu Asn Gly Lys Lys Val Ala Thr

405 410 415

Asn Arg His Lys Ala Ile Glu Gln Thr Thr Asp Ser Leu Glu Glu Phe

420 425 430

Arg Gln Arg Gln Pro Asn Asp Val Tyr Lys Leu Lys Val Lys Glu His

435 440 445

His Pro Glu Tyr Arg Asn Pro Lys Arg Asn Phe Pro Gly Cys Val Phe

450 455 460

Leu Val Gly Lys His Thr His Val Met Gln Gly Thr Ser Gly Ser His

465 470 475 480

Asn Gly Lys Ala Asp Gly Tyr Tyr Asp Thr Asn Gly Asn Ser Tyr Ser

485 490 495

Ser Gly Lys Cys Lys Phe Val Val Lys Asn Lys Gly Ile Val Phe Ala

500 505 510

<210> 639

<211> 344

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-536 effector
<400> 639

Met Tyr Val Phe Val Ile Gly Leu Asp Gly Thr Arg Leu Met Pro Cys
1 5 10 15
Lys Pro Arg Lys Ala Arg Lys Leu Ile Glu Ala His Lys Ala Glu Ile
20 25 30

Tyr Lys Lys Gln Pro Phe Thr Ile Arg Leu Leu Tyr Lys Thr Gly Cys
35 40 45
Ala Ser Gln Pro Ile Thr Leu Gly Ile Asp Thr Gly Ser Gln His Ile
50 55 60
Gly Ile Ala Val Thr Ser Glu Asn Lys Val Leu Tyr Gln Ala Glu Ile
65 70 75 80
Glu Leu Arg Ser Thr Met Asp Lys Arg Ser Leu Met Glu Thr Arg Tyr
85 90 95

Ser Tyr Arg Arg Ser Arg Arg Tyr Arg Lys Thr Arg Tyr Arg Ser Pro
100 105 110
Lys Phe Arg Phe His Thr Lys Arg Thr Tyr Ser Glu Thr Leu Val Lys
115 120 125
Arg Lys Thr Thr Gly Ile Met Thr His Trp Val Lys His Thr Asn Ser
130 135 140
Met Ser Thr Asn Arg Pro Asp Gly Trp Leu Ala Pro Ser Met Gln Ser
145 150 155 160

Lys Val Asp His His Ile Arg Trp Ile Asn Arg Phe Leu Asp Val Leu
165 170 175
Pro Pro Asp Thr Lys Leu Arg Leu Glu Ile Ala Arg Phe Asp Met Ala
180 185 190
Arg Met Lys Asn Pro Glu Val His Asn Glu Leu Tyr Gln His Gly Pro
195 200 205
Gln Tyr Asp Tyr Glu Asn Leu Lys Ala Tyr Val Phe Asn Arg Asp His

210 215 220

Tyr Lys Cys Val Val Cys Lys Arg Lys Leu Gly Ser Lys Gln Pro Asp
225 230 235 240
Gly His Ser Leu Lys Gly Met Met His His Ile Thr Phe Arg Ser Lys
245 250 255
Gly Ala Thr Asp Asn Pro Asp Gln Leu Val Thr Val Cys Glu Tyr Cys
260 265 270
His Thr Pro Gln Ala His Lys Glu Gly Gly Val Leu Trp Asp Leu Lys
275 280 285

Glu Lys His Lys Ser Val Gln Arg Gly Leu Arg Asp Ala Thr Gln Met
290 295 300
Asn Ile Ile Arg Thr Arg Leu Val Lys Ala Phe Pro Asp Ala Glu Leu
305 310 315 320
Thr Tyr Gly Asn Ile Thr Ala Ala Asp Arg Lys Lys Met His Gln Ser
325 330 335
His Met Leu Val Met Gln Leu Gln
340

<210> 640
<211> 512
<212> PRT
<213> Unknown

<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-537 effector
<400> 640
Met Ser Thr Val Tyr Val Leu Asn Lys Asp Gly Lys Pro Leu Met Pro
1 5 10 15
Thr Ala Arg Cys Gly His Val Arg His Leu Leu Lys Glu Gln Lys Ala
20 25 30
Arg Val Val Thr Ser Lys Pro Phe Thr Ile Gln Leu Leu Tyr Glu Thr

35 40 45

Asp Asp Val Val Gln Pro Leu Tyr Leu Gly Ile Asp Pro Gly Arg Thr
50 55 60
Asn Ile Gly Val Ala Val Val Lys Ala Asp Gly Thr Ala Val Phe Thr
65 70 75 80
Ala His Leu Glu Thr Arg Asn Lys Glu Ile Pro Lys Leu Met Lys Lys
85 90 95
Arg Lys Asp Ser Arg Arg Ala Arg Arg Thr Asn Gly Arg Arg Cys Arg
100 105 110

Arg Gln Arg Arg Ala Lys Ala Asn Gly Thr Ile Ser Lys Lys Cys Val
115 120 125
Lys Gln Thr Thr Ala Gln Asn Gly Ser Val Ser Lys Arg Ala Lys Glu
130 135 140
Ile Gly Val Ile Lys Arg His Leu Pro Gly Cys Glu Lys Asp Val Leu
145 150 155 160
Cys Ile Gly Ile Lys Asn Lys Glu Glu Lys Phe Ser Asn Arg Thr Lys
165 170 175

Ser Glu Gly Trp Leu Thr Pro Thr Ala Asn Gln Leu Leu Gln Thr His
180 185 190
Ile Asn Leu Val Lys Lys Ile Arg Lys Phe Leu Pro Ile Ser Asp Val
195 200 205
Val Leu Glu Ile Asn Lys Phe Ala Phe Met Gln Leu Asp Asn Pro Asn
210 215 220
Val Gln Lys Trp Gln Tyr Gln Gln Gly Pro Leu Tyr Gln Lys Ala Asn
225 230 235 240

Leu Glu Glu Ala Val Ser Glu Met Gln Glu His His Cys Leu Phe Cys
245 250 255
Lys Lys Pro Ile Ala His Tyr His His Val Val Pro Gln Ser Glu Asn
260 265 270
Gly Ser Asn Thr Ile Gly Asn Ile Val Gly Leu Cys Thr Lys His His
275 280 285

Asp Leu Val His Lys Asp Thr Ala Trp Gln Lys Lys Leu Ala Lys Lys
290 295 300

Lys Thr Gly Leu Asn Lys Lys Tyr Gly Ala Leu Ser Val Leu Asn Gln
305 310 315 320
Ile Ile Pro Ala Leu Thr Lys Glu Leu Gly Ser Leu Phe Pro Lys His
325 330 335
Phe Phe Ala Thr Asn Gly Lys Ser Thr Tyr Asp Tyr Arg Ala Ala His
340 345 350
Gly Val Arg Lys Asp His Trp Leu Asp Ala Tyr Cys Ile Ala Cys Ser
355 360 365

Val Leu Pro Asn Asp Val Cys Asp Lys Asn Ile Asn Ser Arg Val Leu
370 375 380
Tyr Glu Leu Lys Gln Phe Arg Arg His Asp Arg Arg Ala Leu Asn Asn
385 390 395 400
Glu Asn Met Ser Arg Val Tyr Thr Leu Asn Glu Asn Val Val Ala Thr
405 410 415
Asn Arg His Lys Ala Thr Lys Gln Thr Thr Asp Ser Leu Glu Glu Phe
420 425 430

Arg Gln Asn His Pro Asp Asp Ala Cys Lys Leu Lys Val Lys Glu His
435 440 445
His Pro Thr Tyr Arg Asn Met Ser Arg Asn Tyr Pro Gly Ser Val Phe
450 455 460
Leu Val Gly Asn Gln Val His Met Met Gln Gly Val Ala Gly Ser Lys
465 470 475 480
Asp Gly Lys Ala Thr Thr Tyr Lys Asp Thr Asn Ala Asn Ser Ile Ala
485 490 495

Ala Gly Lys Cys Lys Phe Val Ala Lys Asn Ser Gly Ile Leu Phe Val
500 505 510

<210> 641
<211> 493
<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-538 effector

<400> 641

Met Ala Val Val Tyr Val Ile Ser Ala Ser Gly Lys Pro Leu Met Pro
1 5 10 15
Thr Thr Arg Cys Gly His Val Arg Gly Leu Leu Asn Glu Gly Lys Ala

20 25 30
Arg Val Val Glu Arg Glu Pro Phe Thr Ile Gln Leu Lys Tyr Glu Thr
35 40 45
Glu Glu Met Thr Gln Pro Leu Tyr Leu Gly Ile Asp Pro Gly Arg Thr
50 55 60
Asn Val Gly Ala Ala Val Val Arg Glu Asp Gly Glu Cys Val Phe Thr
65 70 75 80
Ala Gln Leu Thr Thr Arg Asn Lys Asp Val Pro Lys Leu Met Lys Ala

85 90 95
Arg Lys Gln Phe Arg Met Ala His Arg Arg Leu Lys Arg Arg Cys Lys
100 105 110
Arg Gln Arg Arg Ala Lys Gly Ala Gly Thr Leu Ser Gln Lys Gly Glu
115 120 125
Phe Gln Arg Leu Leu Pro Gly Tyr Glu Lys Pro Ile Leu Cys Lys Gly
130 135 140
Ile Arg Asn Lys Glu Ala Arg Phe Asn Asn Arg Gln Arg Pro Val Gly

145 150 155 160
Trp Leu Thr Pro Thr Ala Asn His Leu Leu Leu Thr His Leu Asn Met
165 170 175
Val Lys Lys Leu Gln Lys Leu Leu Pro Ile Thr Asp Val Val Leu Glu
180 185 190
Val Asn Arg Phe Ala Phe Met Ala Met Glu Asn Ser Asn Ile Arg Arg
195 200 205

Trp Gln Tyr Gln Arg Gly Pro Leu Tyr Gly Lys Gly Ser Val Glu Asp

210 215 220

Ala Val Tyr Ala Gln Gln Asp Gly His Cys Leu Phe Cys Gly Lys Pro
225 230 235 240

Ile Ala His Tyr His His Val Val Pro Gln His Lys Asn Gly Ser Asp
245 250 255

Thr Leu Glu Asn Arg Val Gly Leu Cys Asn Glu His His Asp Leu Val
260 265 270

His Lys Asp Arg Ala Leu Glu Ala Lys Met Lys Glu Thr Lys Ala Gly

275 280 285

Leu Asn Lys Lys Tyr His Ala Leu Ser Val Leu Asn Gln Ile Ile Pro
290 295 300

Ala Leu Thr Glu Gln Leu Ala Glu Leu Phe Pro Gln His Ala Phe Val
305 310 315 320

Thr Thr Gly Glu Asp Thr Ala Asp Phe Arg Glu Asp His Gly Ile Ala
325 330 335

Lys Glu His His Leu Asp Ala Tyr Cys Ile Ala Cys Ser Val Leu Ala

340 345 350

Glu Pro Ser Thr Val Ala Ala Pro Thr Ala Lys Pro His Arg Leu Met
355 360 365

Gln Phe Arg Arg His Asp Arg Gln Val Cys His Lys Glu Asn Ile Lys
370 375 380

Arg Val Tyr Leu Leu Asp Gly Lys Ala Val Ala Thr Asn Arg His Lys
385 390 395 400

Ala Ile Glu Gln Lys Asp Asp Ser Leu Glu Glu Phe Cys Lys Thr His

405 410 415

Thr Gln Gln Glu Val Ser Ala Leu Thr Val Lys Gly His Lys Pro Ile
420 425 430

Tyr Lys Glu Ile Gln Arg Phe Met Pro Gly Gly Val Phe Leu Phe Asn
435 440 445

Gly Lys Val His Thr Leu Gln Gly Ser Gln Gly Arg Tyr Lys Gly Met

450 455 460

Pro Lys Tyr Tyr Ile Gly Thr Asp Gly Glu Lys Asn His Ala Lys Arg

465 470 475 480

Cys Ile Phe Leu Gln Gln Asn Cys Gly Leu Arg Trp Ala

485 490

<210> 642

<211> 418

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-539 effector

<400> 642

Met Val Tyr Val Thr Asn Arg Gln Gly Lys Ala Leu Met Pro Thr Asp

1 5 10 15

Arg His Gly Lys Val Arg Arg Leu Leu Lys Ser Gly Leu Ala His Val

20 25 30

Val Arg Arg Ile Pro Phe Thr Ile Gln Leu Asp Tyr Asp Thr Thr Glu

35 40 45

Ile Thr Gln Ser Ile Thr Leu Gly Ile Asp Ala Gly Ser Lys Phe Ile

50 55 60

Gly Val Cys Ala Thr Thr Asp Lys Lys Glu Leu Tyr Ala Ala Asn Val

65 70 75 80

Glu Leu Arg Asn Asp Ile Val Asp Lys Leu Ser Thr Arg Arg Glu Gln

85 90 95

Arg Arg Ala Arg Arg Ser Arg Leu Arg Tyr Arg Lys Ala Arg Phe Asn

100 105 110

Asn Arg Ala Ser Ser Lys Gln Lys Gly Arg Leu Ala Pro Ser Val Glu

115 120 125

Asn Lys Ile Gln Thr His Met Thr Val Val Arg Asn Ala Tyr Lys Ile

130 135 140

Leu Pro Ile Ser Arg Ile Val Val Glu Thr Ala Ser Phe Asp Ile Gln
145 150 155 160
Lys Ile Lys Asn Pro Asn Val Glu Gly Glu Asp Tyr Gln Asn Gly Glu
165 170 175
Gln Met Gly Phe Trp Asn Ile Arg Glu Tyr Val Leu Trp Arg Asp Gly
180 185 190
His Thr Cys Gln His Cys His Gly Lys Ser Gly Asp Lys Ile Leu Asn
195 200 205

Val His His Leu Glu Ser Arg Lys Thr Gly Gly Asn Ser Pro Ser Asn
210 215 220
Leu Ile Thr Leu Cys Glu Thr Cys His Lys Ala Tyr His His Gly Lys
225 230 235 240
Phe Glu Leu Lys Val Lys Arg Ala Ala Ser Phe Arg Asp Ala Ala Phe
245 250 255
Met Gly Ile Met Arg Trp Ala Phe Leu Glu Arg Leu Lys Gln Ile Tyr
260 265 270

Pro Asn Val Ser Met Thr Phe Gly Tyr Val Thr Lys Asn Thr Arg Ile
275 280 285
Ala Asn Gly Leu Pro Lys Glu His Tyr Val Asp Ala Arg Cys Ile Ser
290 295 300
Gly Asn Pro Gln Ala Lys Pro Leu Gly Tyr Tyr Phe Tyr Gln Lys Lys
305 310 315 320
Val Arg Cys Gln Asn Arg Gln Ile His Lys Thr Asn Ile Leu Lys Gly
325 330 335

Gly Lys Lys Lys Leu Asn Gln Ala Pro Phe Val Val Lys Gly Phe Arg
340 345 350
Leu Phe Asp Leu Val Asp Tyr Gln Lys Glu Pro Phe Tyr Val Phe Gly
355 360 365
Arg Arg Lys Ser Gly Tyr Phe Asp Ile Arg Arg Leu Asp Gly Ile Lys
370 375 380

Val Asn Lys Gly Ser Ile Asn Cys Lys Lys Leu Gln Leu Val Glu Thr
385 390 395 400

Arg Arg Thr Leu Leu Thr Glu Arg Arg Lys Ser Gly Ser Ile Pro Pro
405 410 415
Arg Ser

<210> 643
<211> 412
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-540 effector
<400> 643
Met Val Tyr Val Gln Asn Ser Asn Gly Gln Pro Leu Met Pro Thr Glu
1 5 10 15
Asn His Ala Lys Val Arg Ile Leu Leu Lys Gln Asn Asn Ala Val Val

20 25 30
Val Lys Arg Cys Pro Phe Thr Ile Lys Leu Thr Tyr Lys Ser Thr Asn
35 40 45
Tyr Thr Gln Pro Val Thr Leu Gly Val Asp Ala Gly Ser Lys His Ile
50 55 60
Gly Val Ser Ala Thr Thr Glu Asp Lys Glu Ile Tyr Ala Ser Asp Val
65 70 75 80
Glu Leu Arg Asn Asp Ile Val Lys Leu Leu Ser Asn Arg Arg Glu Cys

85 90 95
Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg Lys Thr Arg Phe
100 105 110
Asn Asn Arg Lys Arg Cys Glu Gly Trp Leu Ala Pro Ser Val Lys Gln
115 120 125
Lys Val Asp Thr His Leu Lys Thr Val Asp Asn Val Cys Lys Leu Val

130 135 140

Pro Val Thr Glu Ile Ile Val Glu Thr Ala Ser Phe Asp Ile Gln Lys

145 150 155 160

Ile Lys Asn Pro Asp Ile Glu Gly Val Asp Tyr Gln Gln Gly Glu Gln

165 170 175

Leu Gly Phe Trp Asn Val Arg Glu Tyr Val Leu Cys Arg Asp Gly His

180 185 190

Val Cys Gln Cys Cys Lys Gly Lys Ser Lys Asp Pro Val Leu Asn Val

195 200 205

His His Ile Glu Ser Arg Lys Thr Gly Gly Asn Ala Pro Asn Asn Leu

210 215 220

Ile Thr Leu Cys Glu Thr Cys His Lys Gly Tyr His Lys Gly Ile Val

225 230 235 240

Lys Leu Pro Asp Glu Ile Lys Arg Gly Met Lys Phe Asn Asp Ala Ala

245 250 255

Phe Met Gly Ile Met Arg Trp Ala Phe Tyr Asp Glu Leu Lys Lys His

260 265 270

Tyr Pro Asp Val Ser Leu Thr Tyr Gly Tyr Leu Thr Lys Asn Thr Arg

275 280 285

Ile Arg Asn Gly Leu Pro Lys Glu His Tyr Val Asp Ala Arg Cys Ile

290 295 300

Ser Gly His Pro Leu Ala Lys Pro Leu Gly Glu Val Phe Tyr Thr Lys

305 310 315 320

Lys Val Arg Cys His Asn Arg Gln Ile His Lys Cys Gly Ile Leu Lys

325 330 335

Gly Ser Val Arg Lys Arg Asn Gln Ser Ala Tyr Ile Val Lys Gly Phe

340 345 350

Arg Leu Phe Asp Arg Val Lys Ala Lys Gly Arg Glu Trp Tyr Ile His

355 360 365

Gly Lys Arg Thr Asn Gly Ala Phe Val Leu Lys Cys Leu Asn Gly Ser

370 375 380

Arg Leu Glu Ile Ala Pro Ser Lys Ile Arg Phe Ile Ser Gln Gln His
385 390 395 400
Asn Phe Ile Thr Glu Arg Arg Thr Leu Gly Gln Cys

405 410

<210> 644
<211> 436
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-541 effector
<400> 644
Met Thr Arg Thr Leu Thr Lys Gln Thr Thr Gln Ala Cys Val Leu Asp
1 5 10 15
Gln Gln Gly Lys Pro Leu Met Pro Thr Thr Arg Leu Gly Lys Val Tyr
20 25 30

Arg Leu Leu Lys Thr Gln Lys Ala His Ile Val Ser Tyr Glu Pro Phe
35 40 45
Thr Ile Gln Leu Asp Tyr Glu Pro Asp Thr His Ile Ile Gln Pro Met
50 55 60
Thr Leu Gly Val Asp Ser Gly Ala Ile His Ser Gly Tyr Ser Val Ala
65 70 75 80
Asn Glu His Arg Glu Tyr Tyr Ser Ala Glu Val Ile Ala Arg Asp Asp
85 90 95

Ile Ser Lys Arg Leu Ser Asp Arg Gln Met Tyr Arg Lys Asn Arg Arg
100 105 110
Tyr Arg Lys Thr Arg Tyr Arg Lys Pro Arg Phe Lys Asn Arg Lys Asn
115 120 125
Lys Lys Lys Gly Trp Leu Pro Pro Phe Leu Glu Gln Lys Val Ala Val
130 135 140
Gln Val Asn Glu Ile Asp His Leu Tyr Arg Tyr Phe Pro Ile Glu Thr

145 150 155 160

Ile Ile Ile Glu Val Ala Glu Phe Asp Ile Gln Lys Ile Lys Asp Pro
165 170 175
Asp Ile Ser Gly Val Glu Tyr Gln Gln Gly Thr Leu Gln Gly Tyr Asn
180 185 190
Ile Arg Asn Tyr Leu Leu Glu Lys His Glu Arg Lys Cys Phe Tyr Cys
195 200 205
Gly Lys Ser Val Ser Asp Phe Glu Val Glu His Met Leu Pro Lys Ser
210 215 220

Arg Gly Gly Ser Asn Arg Ile Asp Asn Leu Thr Leu Ser Cys His Asp
225 230 235 240
Cys Asn Gln Lys Lys Asp Thr Leu Thr Ala Glu Glu Phe Ile Lys Gln
245 250 255
Thr Leu Pro Ala Lys Lys Ala Ala Ala Lys Leu Lys Gln Leu Pro Asn
260 265 270
Glu Lys Arg Leu Phe Lys Tyr Met Thr Gln Met Asn Ala Thr Arg Trp
275 280 285

Ala Leu Tyr Asn Ala Ile Asn Glu Lys Tyr Ala Asn Val Lys Ile Thr
290 295 300
Tyr Gly Tyr Ile Thr Lys Tyr Asn Arg Ile Gln Ala Gly Leu Leu Lys
305 310 315 320
Ala His His Ile Asp Ala Lys Cys Ile Thr Gly Phe Ala Thr Val Pro
325 330 335
Ser Ile Asp Gln Thr Val Val Lys Ile Lys Leu Arg Arg His Asn Arg
340 345 350

Gln Leu His Arg Ala Thr Phe Ser Lys Gly His Ala Arg Lys Ala Ala
355 360 365
Cys Leu Pro Thr Ile Thr Phe Gly Phe Gln Leu Tyr Asp Leu Val Tyr
370 375 380
Phe Asp Asn His Tyr Tyr Tyr Ile Lys Gly Arg Arg Ser Ser Gly Ile
385 390 395 400

Phe Ala Leu Val Ser Ile Glu Gly Leu Lys Asp Thr Asn Arg Ser Tyr
405 410 415

Lys Lys Leu Thr Gln Leu Ala His Thr Asn Ala Tyr Leu Ile Asn Arg
420 425 430

Tyr Val Asn Ala
435

<210> 645

<211> 414

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-542 effector

<400> 645

Met Val Tyr Val Ile Ser Gln Asn Lys Lys Pro Leu Met Pro Cys Ser
1 5 10 15

Asn Pro Thr Ala Arg Leu Leu Leu Lys Gln Gly Lys Ala Lys Val Lys
20 25 30

Lys Arg Glu Pro Phe Thr Ile Lys Leu Thr Tyr Glu Thr Thr Asn Tyr
35 40 45

Thr Gln Asp Leu Thr Leu Gly Val Asp Thr Gly Ser Gly Thr Ile Gly
50 55 60

Thr Ala Val Ser Arg Asp Asp Gly Asn Ile Val Tyr Met Ser Glu Val
65 70 75 80

Ile Val Arg Asn Asp Ile Thr Asp Lys Met Thr Gln Arg Ala Lys Tyr
85 90 95

Arg Arg Asn Arg Arg Asn Arg Lys Thr Arg Tyr Arg Lys Ala Arg Trp
100 105 110

Leu Asn Arg Ala Asn Ser Ile Lys Lys Asp Arg Phe Ser Pro Thr Met
115 120 125

Val Ser Lys Phe His Ser His Val Lys Glu Ile Glu Tyr Ile Lys Ser

130 135 140

Ile Leu Pro Ile Thr Glu Met Val Phe Glu Thr Ser Gln Phe Asp Thr
145 150 155 160
His Leu Met Lys Asn Pro Lys Leu Ala Asn Pro Lys Val Arg His Trp
165 170 175
Gly Tyr Gln Lys Gly Thr Asn Tyr Gly Phe Glu Asn Thr Lys Ala Met
180 185 190
Val Leu Asn Arg Asp Asn Tyr Thr Cys Gln Tyr Cys Lys Gly Lys His
195 200 205

Lys Asp Ser Lys Leu Glu Val His His Ile Ile Phe Arg Ser Gln Gly
210 215 220
Gly Ser Asp Glu Glu Ser Asn Leu Ile Thr Leu Cys His Thr Cys His
225 230 235 240
Lys Ala Leu His Asn Gly Lys Ile Arg Pro Asn Leu Ser Gly Lys Val
245 250 255
Lys Gly Thr Leu Lys Tyr Ala Thr Gln Met Asn Ser Ile Arg Lys Gln
260 265 270

Leu Phe Lys Leu Tyr Pro Asn Ala Ile Glu Thr Phe Gly Tyr Val Thr
275 280 285
Lys Ala Asn Arg Leu Gln Leu Gly Val Asp Lys Glu His Tyr Tyr Asp
290 295 300
Ala Cys Val Ile Thr Thr Gln Gly Asn Pro Phe Thr Val Lys Ser Asn
305 310 315 320
Leu Cys Lys Lys Lys Cys Val Ser Asp Gly Asp Phe Gln Lys Thr Lys
325 330 335

Gly Ile Arg Ser Glu Gln Ser Ile Thr Thr Gly Lys Ile Cys Gly Phe
340 345 350
Arg Lys Phe Asp Lys Val His Tyr Phe Gly Lys Asp Tyr Phe Ile Lys
355 360 365
Gly Arg Met Ser Thr Gly Tyr Ala Val Leu Met Asp Ile Asp Gly Asn
370 375 380

Lys Ile Asp Phe Ser Thr Met Pro Lys Gly Tyr Lys Thr Pro Lys Leu
385 390 395 400

Ser Asn Cys Lys Arg Ile Ile Ala Arg Lys Thr Val Met Val
405 410

<210> 646

<211> 421

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-543 effector

<400> 646

Met Asn Met Arg Gly Asp Pro Leu Met Pro Cys Thr Gln Lys Lys Ala
1 5 10 15
Arg Ile Leu Leu Lys Glu Gly Lys Ala Val Ile Tyr Lys Tyr Asp Pro
20 25 30
Phe Thr Ile Gln Leu Thr Tyr Ala Thr Gly Glu Thr Lys Gln Asp Cys
35 40 45
His Ile Gly Ile Asp Thr Gly Ser Lys His Ile Gly Met Ala Ile Thr
50 55 60
Ser Glu Asn Lys Val Leu Phe Lys Gly Glu Ile Glu Leu Arg Gln Asp
65 70 75 80
Val Lys Ser Asn Ile Asp Thr Lys His Ile Tyr Arg Arg Ser Arg Arg
85 90 95
Asn Arg Lys Thr Arg Tyr Arg Gln Pro Arg Phe Leu Asn Arg Lys Arg
100 105 110
Ser Asp Lys Trp Leu Pro Pro Ser Leu Gln Asn Arg Val Asp His Thr
115 120 125
Phe His Trp Ile Asp Thr Phe Cys Ser Leu Val Ser Asp Pro Ile Leu
130 135 140

```
His Ile Glu Val Gly Lys Phe Asp Thr Ala Lys Met Ile Asn Pro Glu

145                 150                 155                 160
Ile Asn Gly Val Asp Tyr Gln His Gly Gln Thr Tyr Gly Phe Phe Glu
                165                 170                 175
Glu Arg Tyr Phe Val Phe Ala Arg Asp Asn Tyr Thr Cys Gln Cys Cys
            180                 185                 190
Gly Lys Ser Lys Asp Lys Ile Leu Gln Thr His His Ile Ile Tyr Arg
        195                 200                 205
Ser Asn Gly Gly Thr Asp Arg Val Asp Asn Leu Ile Thr Val Cys Thr

    210                 215                 220
Asp Cys His Thr Ser Lys Asn His Gln Lys Gly Gly Ile Leu Tyr Lys
225                 230                 235                 240
Trp Gln Glu Gln His Lys Lys Val Lys Gln Tyr Lys Glu Pro Pro Phe
                245                 250                 255
Met Asn Ala Ile Arg Lys Arg Ile Phe Ala Arg Tyr Pro Asn Ala His
            260                 265                 270
Thr Thr Tyr Gly Ser Glu Thr Thr Pro His Arg Lys Glu Leu Gly Leu

        275                 280                 285
Glu Lys Thr His Tyr Asn Asp Ala Ile Thr Ile Ser Gly Ile Thr Asn
    290                 295                 300
Ile Lys Glu Asp Pro Lys Glu Trp Leu Leu Ile Lys Gln Phe Arg Lys
305                 310                 315                 320
Lys Lys Arg Ser Leu His Glu Ala Thr Ala Arg Lys Gly Arg Lys Glu
                325                 330                 335
Pro Asn Cys Phe Gln Lys Arg Asn Ser Lys Asn Thr Pro Phe Tyr Arg

            340                 345                 350
Gly Phe Tyr Leu Asn Asp Lys Val Lys Val Phe Gly His Gly Gln Ile
        355                 360                 365
Gly Tyr Ile Thr Gly Phe Thr Ser Gly Gly Ala Tyr Val Lys Asn Val
    370                 375                 380
Asp Gly Glu Tyr Ile Thr Ile Pro Asn Lys Ser Tyr Lys Gln Val Ser
```

385 390 395 400

Ile Lys Tyr Leu Lys Leu Leu Ser His Asn Asn Asn Trp Gln Tyr Val

405 410 415

Val Lys Ser Ala Val

420

<210> 647

<211> 412

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-544 effector

<400> 647

Met Val Tyr Val Ile Ser Gln Asn Gly Gln Pro Leu Met Pro Thr Glu

1 5 10 15

Asn His Ala Lys Val Arg Ile Leu Leu Lys Asn Lys Lys Ala Lys Val

20 25 30

Ile Lys Lys Cys Pro Phe Thr Ile Gln Leu Ala Tyr Asp Ser Thr Asn

35 40 45

Tyr Thr Gln Asp Ile Thr Leu Gly Val Asp Ser Gly Ser Lys His Ile

50 55 60

Gly Leu Ser Ala Thr Thr Glu Asp Lys Val Leu Phe Glu Ser Asp Val

65 70 75 80

Glu Leu Arg Asn Asp Ile Val Asn Leu Ile Ser Thr Arg Arg Gln Asn

85 90 95

Arg Arg Thr Arg Arg Asn Arg Lys Thr Arg Tyr Arg Lys Pro Arg Phe

100 105 110

Asn Asn Arg Lys Arg Asn Asp Gly Trp Leu Ala Pro Ser Ile Gln Asn

115 120 125

Lys Val Asn Ser His Leu Thr Val Val Arg Lys Val His Glu Ile Leu

130 135 140

Pro Ile Thr Lys Ile Ile Val Glu Val Ala Ser Phe Asp Ile Gln Lys

145 150 155 160

Ile Lys Asn Thr Ala Ile Ser Gly Glu Glu Tyr Gln Lys Gly Glu Gln

165 170 175

Leu Asp Phe Trp Asn Val Arg Glu Tyr Val Leu Phe Arg Asp Gly His

180 185 190

Thr Cys Gln Cys Cys Lys Gly Lys Ser Lys Asp Lys Val Leu Asn Val

195 200 205

His His Ile Glu Ser Arg Lys Thr Gly Gly Asn Ala Pro Asn Asn Leu

210 215 220

Ile Thr Leu Cys Glu Thr Cys His Thr Gly Tyr His Lys Gly Ile Val

225 230 235 240

Lys Leu Pro Lys Thr Ile His Arg Gly Met Ser Phe Lys Asp Ala Thr

245 250 255

Phe Met Gly Ile Met Arg Trp Ala Phe Tyr Asn Lys Leu Lys Glu Ile

260 265 270

Tyr Pro Asn Val Asn Leu Thr Tyr Gly Tyr Ile Thr Lys Asn Thr Arg

275 280 285

Ile Lys Asn Asn Leu Pro Lys Glu His Tyr Ile Asp Ala Arg Cys Ile

290 295 300

Ser Lys His Pro Asn Ala Val Ser Asp Gly Thr Val Tyr Tyr Gln Lys

305 310 315 320

Lys Val Arg Cys His Asn Arg Gln Ile His Lys Ser Thr Ile Leu Lys

325 330 335

Gly Gly Tyr Arg Lys Arg Asn Gln Ala Pro Tyr Thr Val Met Glu Phe

340 345 350

Arg Leu Tyr Asp Lys Val Met Trp Lys Gly Gln Lys Cys Phe Ile Phe

355 360 365

Gly Arg Arg Ser Thr Gly Arg Met Asp Ile Arg Leu Leu Asn Gly Thr

370 375 380

Lys Ile Asn Thr Ser Val Gly His Lys Asn Leu Arg Leu Ile Glu Met

385 390 395 400

Arg Lys Asn Tyr Leu Ile Glu Gln Arg Lys Val Gly

405 410

<210> 648

<211> 499

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-545 effector

<400> 648

Met Arg Tyr Val Tyr Val Leu Asp Gln Glu Glu Arg Pro Leu Met Pro

1 5 10 15

Thr Ser Arg Phe Gly Lys Val Arg Arg Met Leu Lys Ala Gly Gln Ala

20 25 30

Arg Ala Val Ser Thr Leu Pro Phe Thr Ile Gln Leu Thr Tyr Arg Pro

35 40 45

Lys Thr Gln Glu Arg Gln Ala Val Val Ala Gly Met Asp Pro Gly Arg

50 55 60

Thr Asn Ile Gly Leu Ala Ala Val Arg Glu Asp Gly Thr Cys Leu Tyr

65 70 75 80

Gln Ala His Gly Thr Thr Arg Asn Lys Glu Ile Ala Lys Leu Met Ser

85 90 95

Asp Arg Leu Ala Ser Arg Arg Ala Ser Arg Arg Gly Glu Arg Leu Ala

100 105 110

Arg Lys Arg Leu Ala Lys Lys Leu His Thr Thr Ala Lys Lys Leu Leu

115 120 125

Asp Arg Ile Leu Pro Gly Cys Arg Glu Pro Leu Ala Val Lys Asp Ile

130 135 140

Ile Asn Thr Glu Ala Arg Phe Asn Asn Arg Leu Arg Pro Gln Gly Trp

145 150 155 160

Leu Thr Pro Ser Ala Thr Gln Leu Leu Arg Thr His Leu Asn Phe Leu
165 170 175
Lys Lys Met Gln Glu Ile Leu Pro Val Ser Asp Val Val Val Glu Leu
180 185 190
Asn Arg Phe Ala Phe Leu Gln Leu Asp Gln Pro Gly Val Arg Lys Lys
195 200 205
Asp Ile Asp Phe Thr His Gly Ala Leu Tyr Gly Thr Gly Gly Leu His
210 215 220

Ala Ala Val Arg Glu Leu Gln Gln Asp Arg Cys Leu Leu Cys Lys Glu
225 230 235 240
Arg Glu Ile Glu His Phe His His Ile Ile Pro Arg Ser Arg Arg Gly
245 250 255
Ser Asp Thr Leu Ala Asn Leu Ala Gly Leu Cys Glu Arg Cys His Glu
260 265 270
Arg Val His Lys Asn Ala Glu Ala Ala Asp Arg Leu Arg Glu His Lys
275 280 285

Asn Gly Leu Glu Lys Arg Tyr Gly Gly Thr Ser Val Leu Asn Gln Ile
290 295 300
Ile Pro Ser Leu Met Arg Asn Leu Gly Asp Cys Phe Pro Gly His Ala
305 310 315 320
Phe Ala Thr Thr Gly Trp Gln Thr Glu Gln Phe Arg Glu Thr His Gly
325 330 335
Leu Glu Lys Asp His Ala Val Asp Ala Tyr Cys Ile Ala Gly Ser Ile
340 345 350

Leu Gln Pro Ser Val Val Asp Leu Thr Thr Glu Ser Tyr Glu Ile Leu
355 360 365
Gln Phe Arg Arg His Ser Arg Ala Asn Ile Asn His Gln Thr Glu Arg
370 375 380
Thr Tyr Leu Leu Asp Lys Lys Thr Val Ala Trp Asn Arg His Lys Arg
385 390 395 400

Met Asp Gln Lys Thr Asp Ser Leu Gln Glu Trp Tyr Glu Asp Ala Ala
405 410 415

Ala Arg Tyr Gly Glu Lys Gln Ala Asp Arg Leu Arg Ser Arg Leu Thr
420 425 430
Val Lys Lys Ser Thr Arg Tyr Tyr Asn Ser Lys Asp Arg Leu Leu Pro
435 440 445
Gly Thr Val Phe Ser Tyr Glu Gly Lys Arg Tyr Val Leu Thr Gly Gln
450 455 460
Leu Thr Gly Gly Ala Tyr Tyr Arg Ala Tyr Gly Gln Gly Lys Lys Asn
465 470 475 480

Phe Pro Ala Lys Lys Val Arg Ile Leu Cys Gln Asn Glu Gly Leu Val
485 490 495
Tyr Ala Ser

<210> 649
<211> 419
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-546 effector
<400> 649
Met Val Tyr Val Ile Ser Gln Asp Ser Lys Pro Leu Met Pro Cys Ser
1 5 10 15
Asn Pro Ile Ala Arg Leu Leu Leu Lys Gln Gly Lys Ala Lys Val Lys

20 25 30
Arg Arg Glu Pro Phe Thr Ile Lys Leu Ile Tyr Glu Thr Thr Asp Tyr
35 40 45
Thr Gln Asp Leu Thr Leu Gly Val Asp Thr Gly Ser Gly Thr Ile Gly
50 55 60
Ala Ala Val Ser Lys Asp Asn Gly Asp Ile Val Tyr Met Ser Glu Val

65 70 75 80

Val Val Arg Asn Asp Ile Thr Asp Lys Met Thr Gln Arg Ala Lys Tyr

85 90 95

Arg Arg Asn Arg Arg Asn Arg Lys Thr Arg Tyr Arg Lys Ala Arg Trp

100 105 110

Leu Asn Arg Ser Asn Ser Ile Lys Lys Asp Arg Phe Ser Pro Thr Met

115 120 125

Gln Ser Lys Leu His Ser His Val Lys Glu Ile Glu Tyr Ile Gln Ser

130 135 140

Ile Leu Pro Ile Thr Glu Met Val Phe Glu Thr Gly Gln Phe Asp Met

145 150 155 160

His Leu Met Lys Asn Pro Ser Leu Ala Asn Pro Lys Val Arg Pro Trp

165 170 175

Gly Tyr Gln Lys Gly Thr Asn Tyr Gly Phe Glu Asn Thr Lys Ala Met

180 185 190

Val Leu Asn Arg Asp Asn Tyr Thr Cys Gln Cys Cys Lys Gly Lys His

195 200 205

Lys Asp Ser Lys Leu Glu Val His His Ile Val Phe Arg Ser Gln Gly

210 215 220

Gly Ser Asp Glu Glu Ser Asn Leu Ile Thr Leu Cys His Thr Cys His

225 230 235 240

Lys Asp Leu His Ser Gly Lys Ile Asn Leu Lys Leu Ser Gly Lys Val

245 250 255

Lys Gly Asn Leu Lys Tyr Ala Thr Gln Met Asn Ser Ile Arg Lys Gln

260 265 270

Leu Phe Arg Leu Tyr Pro Asn Ala Ile Glu Thr Phe Gly Tyr Val Thr

275 280 285

Lys Ala Asn Arg Leu His Leu Ser Val Asp Lys Glu His Tyr Tyr Asp

290 295 300

Ala Cys Thr Ile Ala Thr Gln Gly Asn Ala Phe Asn Val Lys Ser Asp

305 310 315 320

Leu Tyr Lys Lys Lys Cys Val Ser Asp Gly Asp Phe Gln Lys Thr Lys
325 330 335
Gly Ile Arg Ser Glu Gln Pro Ile Val Thr Asp Lys Ile Cys Gly Phe

340 345 350
Arg Lys Phe Asp Lys Val Arg Tyr Phe Gly Lys Asp Tyr Phe Ile Lys
355 360 365
Gly Arg Met Ser Thr Gly Tyr Ala Ile Leu Met Asp Ile Asp Gly Asn
370 375 380
Lys Ile Asp Phe Ser Thr Met Pro Arg Gly Tyr Lys Thr Pro Lys Leu
385 390 395 400
Ser Asn Cys Lys Arg Ile Thr Ala Arg Ser Thr Val Met Thr Gln Val

405 410 415
Lys Val Val

<210> 650
<211> 515
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-547 effector
<400> 650
Met Thr Ala Leu Glu Glu Arg Leu Ser Lys Thr Glu Tyr Ile Tyr Val
1 5 10 15
Leu Gly Phe Asp Gly Lys Pro Gln Met Pro Thr Arg Arg Lys Arg His
20 25 30

Val Leu Lys Leu Leu Lys Thr Gly Arg Ala Arg Ile Ala Glu Asp Ile
35 40 45
Pro Leu Thr Ile Arg Leu Thr Tyr Arg Asn Ala Pro Val Leu Gln Pro
50 55 60
Val Thr Leu Ala Glu Asp Pro Gly Arg Thr Asn Ile Gly Ala Ala Val

65 70 75 80

Leu Ser Pro Leu Gly Asp Leu Leu Phe Ala Ala Val Ile Glu Thr Arg

85 90 95

Asn Lys Glu Ile Lys Lys Leu Met Thr Asp Arg Gln Lys Ser Arg Gln

100 105 110

Ala Ser Arg Arg Gly Glu Arg Lys Ala Arg Gln Arg Leu Ala Lys Arg

115 120 125

Tyr Gly Ser Ile Val Lys Ser Gly Met Val Met Arg Lys Leu Pro Met

130 135 140

Tyr Ala Ala Asp Arg Phe Val Thr Cys Lys Phe Ile Arg Asn Thr Gln

145 150 155 160

Ala Arg Phe Cys Asn Arg Lys Arg Cys Pro Asp Trp Ile Thr Pro Thr

165 170 175

Val Gln His Leu Val Gln Thr His Leu Asn Ile Ile Arg Lys Ile Ser

180 185 190

Arg Tyr Leu Pro Val Thr Asp Ile Ala Phe Glu Val Asn Arg Phe Ala

195 200 205

Phe Met His Met Glu Asn Pro Lys Ala Met Gly Val Asp Phe Gln Asn

210 215 220

Gly Pro Leu Lys Gly Tyr Asp Asp Val Lys Glu Ala Ile Cys Thr Gln

225 230 235 240

Gln His Gly Lys Cys Leu Met Cys Lys Lys Pro Ile Ala His Phe His

245 250 255

His Ile Val Pro Arg Ser Arg Gly Gly Ser Asp Thr Ile Gln Asn Leu

260 265 270

Ala Gly Leu Cys Pro Glu Cys His Thr Lys Val His Thr Asp Thr Thr

275 280 285

Phe Arg Lys Asp Phe Asp Arg Lys Lys Ser Gly Gln Leu Lys Lys Tyr

290 295 300

Gly Ala Leu Ser Ala Leu Asn Gln Ala Val Pro Phe Ile Cys Lys Lys

305 310 315 320

Leu Leu Glu Glu Tyr Gly Glu Glu His Val His Phe Cys Gly Gly Leu
325 330 335
Asp Thr Ser Leu Ile Arg Thr Ala Leu Gly Phe Glu Lys Thr Lys Lys
340 345 350

Asn Gln Met His Glu Val Asp Ala Tyr Cys Ile Gly Leu Ala Ala Leu
355 360 365
Glu Val Asn Glu Val Glu Thr Pro Ala Phe Asp His Thr Phe Gln Ile
370 375 380
Arg Gln Phe Arg Arg Gln Asp Arg Ser Ile Ile His His Gln Thr Gly
385 390 395 400
Arg Ser Tyr Tyr Gln Gly Lys Glu Lys Val Ala Gln Asn Arg Lys Pro
405 410 415

Gly Phe Glu Gln Lys Thr Thr Ala Leu Ser Gln Trp Tyr Glu Glu Gln
420 425 430
Val Arg Ile His Gly Glu Lys Glu Ala Glu Lys Leu Arg Ser Gln Leu
435 440 445
Arg Val Glu Lys Ser Cys Arg His Tyr Asn Asp Met Asp Arg Phe Leu
450 455 460
Pro Gly Ala Val Phe Leu Tyr Glu Gly Lys Arg Tyr Val Leu Ser Gly
465 470 475 480

Arg Ile Thr Asn Gly Lys Tyr Leu Arg Ala Cys Gly Gln Gly Met Lys
485 490 495
Asn Phe Pro Ala Ala Glu Cys Thr Phe Ile Arg His Asn Ala Gly Leu
500 505 510
Val Phe Ile
515

<210> 651
<211> 419
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-548 effector

<400> 651

Met Val Tyr Val Ile Ser Gln Asp Ser Lys Pro Leu Met Pro Cys Ser

1 5 10 15

Asn Pro Ile Ala Arg Leu Leu Leu Lys Gln Gly Lys Ala Lys Val Lys

20 25 30

Arg Arg Glu Pro Phe Thr Ile Lys Leu Ile Tyr Glu Thr Thr Asp Tyr

35 40 45

Thr Gln Asp Leu Thr Leu Gly Val Asp Thr Gly Ser Gly Thr Ile Gly

50 55 60

Ala Ala Val Ser Lys Asp Asn Gly Asp Ile Val Tyr Met Ser Glu Val

65 70 75 80

Val Val Arg Asn Asp Ile Thr Asp Lys Met Thr Gln Arg Ala Lys Tyr

85 90 95

Arg Arg Asn Arg Arg Asn Arg Lys Thr Arg Tyr Arg Lys Ala Arg Trp

100 105 110

Leu Asn Arg Ser Asn Ser Ile Lys Lys Asp Arg Phe Ser Pro Thr Met

115 120 125

Gln Ser Lys Leu His Ser His Val Lys Glu Ile Glu Tyr Ile Gln Ser

130 135 140

Ile Leu Pro Ile Thr Glu Met Val Phe Glu Thr Gly Gln Phe Asp Met

145 150 155 160

His Leu Met Lys Asp Pro Ser Leu Ala Asn Pro Lys Val Arg Pro Trp

165 170 175

Gly Tyr Gln Lys Gly Thr Asn Tyr Gly Phe Glu Asn Thr Lys Ala Met

180 185 190

Val Leu Asn Arg Asp Asn Tyr Thr Cys Gln Cys Cys Lys Gly Lys His

195 200 205

Lys Asp Ser Lys Leu Glu Val His His Ile Val Phe Arg Ser Gln Gly

210 215 220

Gly Ser Asp Glu Glu Ser Asn Leu Ile Thr Leu Cys His Thr Cys His
225 230 235 240
Lys Asp Leu His Ser Gly Lys Ile Asn Leu Lys Leu Ser Gly Lys Val
245 250 255
Lys Gly Asn Leu Lys Tyr Ala Thr Gln Met Asn Ser Ile Arg Lys Gln

260 265 270
Leu Phe Arg Leu Tyr Pro Asn Ala Ile Glu Thr Phe Gly Tyr Val Thr
275 280 285
Lys Ala Asn Arg Leu His Leu Gly Val Asp Lys Glu His Tyr Tyr Asp
290 295 300
Ala Cys Thr Ile Ala Thr Gln Gly Asn Thr Phe Asn Val Lys Ser Asn
305 310 315 320
Leu Tyr Lys Lys Lys Cys Val Ser Asp Gly Asp Phe Gln Lys Thr Lys

325 330 335
Gly Ile Cys Ser Glu Gln Pro Ile Val Thr Asp Lys Ile Cys Ser Phe
340 345 350
Arg Lys Phe Asp Lys Val Arg Tyr Phe Gly Lys Asp Tyr Phe Ile Lys
355 360 365
Gly Arg Met Ser Thr Gly Tyr Ala Ile Leu Met Asp Ile Asp Gly Asn
370 375 380
Lys Ile Asp Phe Ser Thr Met Pro Arg Gly Tyr Lys Thr Pro Lys Leu

385 390 395 400
Ser Asn Cys Lys Arg Ile Thr Ala Arg Ser Thr Val Met Thr Gln Val
405 410 415
Lys Val Val

<210> 652
<211> 507
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-549 effector

<400> 652

```
Met Ser Glu Tyr Ile Tyr Val Ile Gly Met Asp Gly Asp Pro Gln Met
1               5                  10                  15

Pro Thr Lys Arg Lys Arg His Val Glu Lys Leu Leu Gln Thr Gly Arg
            20                  25                  30
Ala Arg Val Phe Arg Gln Val Pro Tyr Thr Ile Gln Leu Thr Tyr Lys
        35                  40                  45
Asn Gln Pro Val Leu Gln Pro Val Thr Ile Ala Glu Asp Pro Gly Arg
    50                  55                  60
Ser Asn Ile Gly Met Ala Val Val Ser Leu Ser Gly Glu Leu Leu Ser
65                  70                  75                  80

Ala Ala Val Val Gln Thr Arg Asn Lys Glu Ile Val Lys Leu Met Glu
                85                  90                  95
Lys Arg Lys Leu His Arg Arg Ala Ser Arg Asn Gly Glu Arg Lys Ala
            100                 105                 110
Arg Gln Arg Leu Ala Lys Arg Cys His Thr Met Leu Lys Ala Gly Phe
        115                 120                 125
Leu Met Arg Lys Leu Pro Met Tyr Arg Lys Asp Lys Arg Val Lys Cys
    130                 135                 140

Leu Val Ile Arg Asn Thr Glu Ala Arg Phe Cys Asn Arg Lys Arg Glu
145                 150                 155                 160
Asp Gly Trp Leu Thr Pro Ser Ala Glu His Leu Val Arg Thr His Ile
                165                 170                 175
Asn Leu Ile His Lys Met Gln Lys Phe Leu Pro Ile Thr Asp Val Ala
            180                 185                 190
Ile Glu Ile Asn Arg Phe Ala Phe Leu Ser Leu Glu Asp Pro Ser Ile
        195                 200                 205

Ser Gly Val Asp Phe Gln Lys Gly Pro Leu Lys Gly Tyr Asp Asp Leu
    210                 215                 220
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Asn Ala Ala Val Glu Asp Leu Gln Asp Gly His Cys Leu Met Cys Asp
225 230 235 240
Ser Pro Ile Glu His Arg His His Ile Val Pro Arg Ser Met Gln Gly
245 250 255
Ser Asn Thr Ile Gly Asn Ile Ala Gly Leu Cys Cys Lys Cys His Glu
260 265 270

Arg Val His Lys Asp Ala Arg Phe Glu Asp Arg Leu Lys Lys Lys Lys
275 280 285
Ala Gly Leu Asp Lys Arg Tyr Ala Ala Val Ser Ala Leu Asn Gln Ala
290 295 300
Ile Pro Phe Ile Cys Lys Arg Leu Glu Gln Glu Phe Gly Lys Glu His
305 310 315 320
Val His Tyr Cys Ser Gly Arg Asp Thr Ala Met Val Arg Arg Ser Phe
325 330 335

Gly Tyr Tyr Lys Thr Lys Glu Glu Gln Leu His Glu Val Asp Ala Trp
340 345 350
Cys Ile Ala Val Leu Ser Leu Gln Gln Val Pro Glu Lys Ala Pro Glu
355 360 365
Phe Asp His Val His Glu Ile Leu Gln Phe Arg Arg Gln Asp Arg Ser
370 375 380
Ile Ile Asn Ala Gln Thr Ser Arg Arg Tyr Tyr His Glu Gly Lys Lys
385 390 395 400

Ile Ala Lys Asn Arg Lys Lys Ala Glu Gly Gln Arg Glu Asp Ser Leu
405 410 415
Gln Glu Trp Arg Lys Arg Gln Val Glu Arg Tyr Gly Glu Glu Gln Thr
420 425 430
Arg Lys Met Ile Ser Gln Leu Lys Val Lys Lys Ser Ile Arg Arg Tyr
435 440 445
Asn Arg Leu Asn Arg Leu Met Pro Gly Ala Val Phe Tyr Tyr Gln Gly
450 455 460

Val Arg Tyr Val Met Arg Gly Gln His Cys Glu Gly Thr Tyr Leu Gln

465 470 475 480

Ala Val Gly Met Gly Ser Lys Asp Phe Pro Ala Lys Lys Cys Lys Ile

485 490 495

Val Ala Asn Asn Glu Gly Leu Val Phe Val Ser

500 505

<210> 653

<211> 419

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-550 effector

<400> 653

Met Val Tyr Val Leu Asp Ser Asn Gly Gln Pro Leu Met Pro Thr Ala

1 5 10 15

Arg His Gly Lys Val Arg Arg Leu Leu Asn Ser His Leu Ala Lys Val

20 25 30

Val Lys Arg Cys Pro Phe Thr Ile Gln Leu Leu Tyr His Ser Thr Lys

35 40 45

Glu Thr Gln Pro Val Ser Leu Ser Val Asp Ala Gly Ser Lys His Ile

50 55 60

Gly Leu Ala Ala Thr Thr Glu Lys Lys Val Val Tyr Gln Glu Glu Leu

65 70 75 80

Ile Pro Arg Asn Asp Val Val Lys Leu Leu Ser Glu Arg Arg Thr Leu

85 90 95

Arg Arg Ser Arg Arg Asn Arg Lys Thr Arg Tyr Arg Lys Ala Arg Phe

100 105 110

Asn Asn Arg Val His Ser Lys Gln Lys Gly Trp Leu Ala Pro Ser Val

115 120 125

Glu Val Lys Ile Gln Glu His Ile Thr Val Ile Lys Lys Ile Cys Gln

130 135 140

Ile Leu Pro Val Ser Glu Ile His Val Glu Thr Ala Glu Phe Asp Leu
145 150 155 160
Gln Arg Leu Lys Ala Met Glu Glu Gly Lys Pro Leu Pro Val Gly Thr
165 170 175
Asp Tyr Gln Met Gly Glu Pro Tyr Asp Phe Tyr Asn Thr Arg Gln Tyr

180 185 190
Val Leu His Arg Asp Gly Tyr Thr Cys Gln Cys Cys Gly Thr His Asp
195 200 205
Lys Asp Val Lys Leu His Val His His Ile Glu Ser Arg Gln Thr Gly
210 215 220
Gly Asn Ala Pro Asn Asn Leu Ile Thr Leu Cys Glu His Cys His Lys
225 230 235 240
Ala Leu His Glu Gly Lys Ile Glu Leu Pro Lys Gly Lys Lys Arg Gly

245 250 255
Lys Ser His Arg Asp Ala Thr Phe Met Gly Ile Met Arg Asn Thr Leu
260 265 270
Leu Glu Arg Leu Lys Lys Glu Val Asp Val Pro Val Thr Gly Thr Tyr
275 280 285
Gly Tyr Ile Thr Lys Tyr Trp Arg Glu Lys Ala Gly Leu Glu Lys Ser
290 295 300
His Ile Asn Asp Ala Val Cys Ile Ser Lys His Pro Tyr Ala Lys Pro

305 310 315 320
Leu Asp Thr Tyr Tyr Leu Thr Lys Ala Val Arg His His Asn Arg Gln
325 330 335
Ile His Lys Ala Asn Phe Ser Lys Gly Ser Ile Arg Lys Arg Asn Gln
340 345 350
Ala Pro Tyr Ile Val Lys Gly Leu Arg Leu Phe Asp Lys Val Leu Tyr
355 360 365
Gln Gly Lys Glu Cys Phe Ile Phe Gly Arg Arg Val Ser Gly Ser Met

370 375 380
Asp Val Arg Leu Leu Asp Gly Thr His Ile Asn Ala Ser Val Gly Tyr

385 390 395 400

Lys Asn Leu Lys Phe Leu Glu Ser Arg Lys Ala Tyr Leu Thr Glu Arg

405 410 415

Arg Ala Cys

<210> 654

<211> 321

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-551 effector

<400> 654

Met His Gly Lys Arg Asp Gly Leu Trp Leu Pro Pro Ser Val Lys Ser

1 5 10 15

Lys Val Gly His Asn Ile Ala Trp Ile Lys Arg Tyr Leu Ala Val Leu

20 25 30

Pro Asn Pro Asp Leu His Ile Glu Val Gly Lys Phe Asp Met Ala Lys

35 40 45

Met Val Asn Pro Asp Ile Ser Gly Lys Gln Tyr Gln Glu Gly Ser Leu

50 55 60

His Gly Trp Lys Asn Tyr Lys Tyr His Val Leu Ala Arg Asp Glu Tyr

65 70 75 80

Thr Cys Gln Leu Cys His Lys His Gly Glu Gly Val Lys Leu Val Val

85 90 95

His His Ile Val Tyr Arg Ser Gln Gly Gly Thr Asp Arg Val Asp Asn

100 105 110

Leu Ile Thr Leu Cys Thr Asn Cys His Thr Thr Lys Asn His Gln Pro

115 120 125

Gly Gly Lys Leu Tyr Lys Trp Met Lys Ala Lys Lys Lys Val Thr Lys

130 135 140

Gln Leu Lys Gly Ala Thr Phe Met Asn Ile Leu Arg Lys Arg Ile Met
145 150 155 160
Thr Thr Phe Pro Glu Ala Ser Phe Gln Tyr Gly Ser Gln Thr Tyr Val
165 170 175
Asp Arg Lys Asn Leu Leu Leu Pro Lys Gly His Phe Met Asp Ala Ile

180 185 190
Ala Ile Ser Gly Ile Lys Ser Val Gly Gln Met Pro Leu Ala Val Thr
195 200 205
Met Ile Ser Gln Phe Arg Lys Lys Lys Arg Ser Leu His Glu Ala Thr
210 215 220
Ala Arg Lys Gly Arg Lys Gln Pro Asn Thr Ser Ala Lys Arg Asn Glu
225 230 235 240
Lys Asn Thr Lys Tyr Ala Arg Gly Leu Trp Leu Asn Asp Tyr Val Arg

245 250 255
Val Ile Gly Asn Asn Val Lys Gly Tyr Val Lys Gly Phe Lys Ser Asn
260 265 270
Gly Tyr Ser Val Tyr Leu Thr Asp Gly Leu Gly Asn Tyr Val Val Ser
275 280 285
Asn Gly Arg Asn Tyr Ile Asn Ser Lys Gln Cys Gln Leu Ile Thr His
290 295 300
Asn Gly Asn Trp Gln Lys Ala Asp Gln Lys Leu Leu Leu Tyr Glu Phe

305 310 315 320
Lys

<210> 655
<211> 136
<212> PRT
<213> Unknown
<220><223> Description of Unknown:
uncultivated organism
<220><223> Category: MG35 effectors
<220><223> Description: MG35-552 effector

<400> 655

Met Lys His Glu Asn Ala Asn Arg Val Phe Leu Leu Asn Lys Asp Gly
1 5 10 15
Lys Pro Leu Met Pro Cys Arg Pro Arg Lys Ala Arg Leu Leu Leu Lys
20 25 30

Ser Gly Lys Ala Phe Val Val Lys Lys Tyr Pro Phe Thr Ile Gln Leu
35 40 45
Lys Tyr Gly Ser Tyr Gly Tyr Lys Gln Lys Val Ser Leu Gly Val Asp
50 55 60
Thr Gly Gln Arg His Ile Gly Phe Ala Val Val Ser Gln Asp Lys Val
65 70 75 80
Leu His Gln Ser Glu Val Glu Leu Arg Gln Asp Val His Lys Asn Leu
85 90 95

Tyr Thr Arg Lys Ile Tyr Arg Arg Gly Arg Arg Asn Arg Lys Thr Arg
100 105 110
Tyr Arg Gln Ala Arg Phe Leu Asn Arg Val His Gly Lys Arg Asp Gly
115 120 125
Leu Trp Leu Pro His Leu Ser Ser
130 135

<210> 656

<211> 429

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-553 effector

<400> 656

Met Pro Val Tyr Val Leu Asn Asp Asn Gly Gln Pro Leu Met Pro Thr
1 5 10 15
Lys Arg Phe Gly Lys Val Arg Arg Leu Leu Lys Glu Gly Lys Ala Glu
20 25 30

Val Val Asn Arg Cys Pro Phe Thr Ile Arg Leu Asn Tyr His Ala Glu
35 40 45
Glu Asn Val Gln Pro Val Ala Leu Gly Ile Asp Ala Gly Ser Lys Ile
50 55 60

Ile Gly Val Ser Ala Thr Thr Glu Ala Gln Val Leu Tyr Glu Ala Glu
65 70 75 80
Val Gly Leu Arg Asn Asp Ile Ser Asp Leu Leu Ala Ala Lys Arg Glu
85 90 95
Leu Arg Arg Ala Arg Arg Gly Arg Lys Thr Arg Tyr Arg Lys Pro Arg
100 105 110
Phe Leu Asn Arg Thr Ala Ser Lys Lys Lys Asp Trp Phe Ala Pro Ser
115 120 125

Val Lys Gln Lys Val Glu Thr His Leu Thr Val Ile Arg Lys Val His
130 135 140
Glu Leu Leu Pro Val Ser Ser Ile Ile Val Glu Thr Ala Gln Phe Asp
145 150 155 160
Leu Gln Arg Ile Lys Ala Met Glu Glu Gly Arg Pro Ile Pro Glu Gly
165 170 175
Thr Asp Tyr Gln Asn Gly Glu Thr Lys Asp Phe Ala Asn Leu Arg Glu
180 185 190

Tyr Cys Phe His Arg Asp Gly Tyr Thr Cys Gln Tyr Cys Lys Gly Lys
195 200 205
Ser Gly Asp Lys Leu Leu His Met His His Phe Asn Tyr Trp Arg Gly
210 215 220
Asp His Ser Asn Lys Pro Asp Ser Val Ile Thr Leu Cys Ala Thr Cys
225 230 235 240
Asn Asp Ser Arg Asn His Lys Lys Gly Gly Pro Leu Trp Gly Trp Glu
245 250 255

Pro Ser Leu Ala Arg Ser Tyr Lys Asp Ala Ala Phe Met Gly Ile Met
260 265 270
Arg Trp Ala Leu Tyr Asn Lys Leu Lys Ser Ile Tyr Pro Asp Val His

275 280 285

Leu Thr Tyr Gly Tyr Ile Thr Lys Asp Asp Arg Ile Lys Ala Gly Leu

290 295 300

Ala Lys Ala His Tyr Thr Asp Ala Arg Cys Ile Ser Gly His Pro Asn

305 310 315 320

Ala Lys Ser Leu Gly Tyr Tyr Phe Tyr Gln Lys Lys Val Arg Cys His

325 330 335

Asn Arg Gln Ile His Lys Leu Thr Ile Ser Lys Gly Gly Tyr Arg Lys

340 345 350

Asn Asn Gln Ala Ala Lys Tyr Val Phe Gly Tyr Gln Leu Phe Asp Lys

355 360 365

Val Ser Tyr Lys Gly Lys Glu Cys Phe Ile Phe Gly Arg Arg Ser Ser

370 375 380

Gly Ser Phe Asp Ile Arg Thr Leu Asn Gly Thr Lys Val Ser Ala Gly

385 390 395 400

Val Ser Tyr Arg Lys Leu Lys Arg Leu Glu Lys Arg Lys Ser Phe Leu

405 410 415

Thr Glu Arg Arg Val Thr Met Gln Glu Val Arg Ala Gln

420 425

<210> 657

<211> 433

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-554 effector

<400> 657

Met Gln Asn Arg Val Phe Val Ile Asn Lys His Gly Glu Ala Leu Met

1 5 10 15

Pro Cys Lys Pro Arg Lys Ala Arg Val Leu Leu Arg Asp Gly Lys Ala

20 25 30

Lys Val Ile Lys Lys Glu Pro Phe Thr Ile Gln Leu Ser Tyr Gly Ser

35 40 45

Thr Gly Tyr Lys Gln Asp Val Ser Leu Gly Ile Asp Ser Gly Gln Arg

50 55 60

His Ile Gly Leu Ala Val Thr Ser Gln Asp Lys Val Leu Phe Gln Gly

65 70 75 80

Glu Val Glu Leu Arg Gln Asp Val Lys Lys Leu Leu Asp Thr Arg Arg

85 90 95

Thr Tyr Arg Arg Ser Arg Arg Asn Arg Lys Ile Arg Tyr Arg Lys Ala

100 105 110

Arg Phe Leu Asn Arg Ile Ala Lys Lys Lys Asp Asn Trp Leu Pro Ser

115 120 125

Ser Val Ala Ser Lys Val Asn His Asn Ile Asn Trp Ile Lys Arg Leu

130 135 140

Leu Ser Val Leu Pro Lys Ala Asp Leu His Ile Glu Val Gly Lys Phe

145 150 155 160

Asp Met Gln Lys Met Lys Asn Pro Glu Ile Asn Gly Glu Gly Tyr Gln

165 170 175

Gln Gly Asp Leu Tyr Gly Tyr Gln Thr Val Lys Gln Phe Ile Leu Ala

180 185 190

Arg Asp Asn Tyr Thr Cys Gln Ala Cys Lys Lys Lys Gly Gly Lys Leu

195 200 205

Lys Ile His His Ile Ile Tyr Arg Ser Leu Gly Gly Thr Asn Thr Val

210 215 220

Asp Asn Leu Ile Thr Val Cys Ser Lys Cys His Thr Thr Lys Asn His

225 230 235 240

Gln Thr Gly Ile Ile Ala Lys Trp Cys Lys Asp Lys Lys Lys Val Asn

245 250 255

Lys Ser Tyr Lys Gly Ala Thr Phe Met Asn Ile Leu Arg Arg Arg Leu

260 265 270

Tyr Thr Ala Phe Pro Gln Ala Lys Phe Gln Tyr Gly Ala Trp Thr Thr

275 280 285

Leu Gln Arg Met Asp Leu Lys Leu Thr Lys Ser His Tyr Asn Asp Ala

290 295 300

Val Ala Ile Ser Gly Ile Lys Gln Ile Lys Glu Lys Pro Thr Ser Ile

305 310 315 320

Met Met Phe Lys Gln Phe Arg Lys Lys Lys Arg Ser Leu His Glu Ala

325 330 335

Thr Ala Arg Lys Gly Arg Lys Thr Pro Asn Val Ile Ser Lys Arg Asn

340 345 350

Ala Lys Asn Thr Lys Tyr Ala Lys Gly Phe Trp Leu Asn Asp Tyr Val

355 360 365

Lys Ile Lys Asp Ser Asn Lys Lys Gly Tyr Ile Ser Gly Phe Ser Lys

370 375 380

Thr Thr Cys Tyr Ile Lys Asp Ile Phe Gly Asn Tyr Leu Thr Ile Ser

385 390 395 400

Asp Arg Tyr Lys Gln Val Ala Leu Ser Lys Leu Asp Arg Leu Ser His

405 410 415

His Asn Asn Trp Ser Lys Gln Glu Ile Asn Glu Asn Val Tyr Gln Met

420 425 430

Asn

<210> 658

<211> 427

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-555 effector

<400> 658

Met Val Tyr Val Leu Asp Ile Asp Gly Phe Pro Leu Met Pro Thr Asn

1 5 10 15

Arg His Gly Lys Val Arg His Leu Leu Glu Thr Gly Lys Ala Lys Val
20 25 30
Val Arg Arg Asn Pro Phe Thr Ile Lys Leu Leu Tyr Asp Ser Lys Arg
35 40 45

Tyr Val Asn Pro Leu Thr Leu Gly Val Asp Thr Gly Ser Gly Ala Phe
50 55 60
Ala Thr Ala Val Val Gly Glu Lys Gln Glu Val Leu Tyr Leu Ser Glu
65 70 75 80
Val Thr Val Arg Asn Asp Ile Lys Asp Arg Met Thr Arg Arg Leu Ser
85 90 95
Tyr Arg Arg Ile Arg Arg Asn Arg Lys Thr Arg Tyr Arg Gln Ala Arg
100 105 110

Trp Leu Asn Arg Lys Asn Ser Ile Lys Gln Asn Arg Phe Ser Pro Thr
115 120 125
Met Ile Ser Lys Phe Asn Ser His Ile Arg Glu Ile Glu Phe Ile Arg
130 135 140
Ser Ile Leu Pro Ile Ser Asn Leu Val Leu Glu Thr Ala Thr Phe Asp
145 150 155 160
Thr His Leu Met Lys Asn Pro Ala Leu Ala Asn Glu Lys Tyr Lys His
165 170 175

Trp Gly Tyr Gln Gln Gly Ser Asn Tyr Gly Phe Glu Asn Thr Lys Ala
180 185 190
Met Ile Leu Asn Arg Asp Asn Tyr Thr Cys Gln Tyr Cys Lys Gly Lys
195 200 205
Tyr Lys Asp Ser Lys Leu Glu Val His His Ile Ile Phe Lys Ser Asn
210 215 220
Gly Gly Ser Asn Glu Ala Glu Asn Leu Ile Thr Leu Cys Lys Thr Cys
225 230 235 240

His Asp Asn Leu His Lys Gly Lys Ile Asn Leu Lys Leu Lys Gly Lys
245 250 255
Val Lys Gly Thr Leu Lys Tyr Ala Thr Gln Met Asn Ser Ile Arg Ile

260 265 270

Gln Leu Leu Asn Tyr Tyr Pro Asn Ala Ile Glu Thr Phe Gly Tyr Ile

275 280 285

Thr Lys Ala Asn Arg Gln Phe Asn Asn Leu Pro Lys Glu His Tyr Ile

290 295 300

Asp Ala Cys Met Ile Ala Ser Gln Gly Lys Pro Ile Arg Phe Ile Thr

305 310 315 320

Asn Ser Ile Tyr Leu Lys Lys Cys Val Pro Lys Gly Asp Tyr Arg Gln

325 330 335

Thr Asn Gly Val Arg Ser Glu Lys Lys Leu Thr Thr Gly Lys Leu Cys

340 345 350

Gly Phe Arg Lys Phe Asp Lys Val Lys Tyr Phe Gly Lys Val Tyr Phe

355 360 365

Ile Lys Gly Arg Met Tyr Thr Gly Tyr Cys Lys Leu Met Asp Ile Tyr

370 375 380

Gly Lys Thr Ile Asp Phe Ser Asn Met Pro Lys Gly Phe Lys Ser Pro

385 390 395 400

Lys Leu Ser Asn Cys Gln Arg Ile Ser Ala Arg Thr Ser Ile Ile Cys

405 410 415

Tyr Glu Lys His Ile Asn Phe Asn Thr Gly Glu

420 425

<210> 659

<211> 519

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-556 effector

<400> 659

Met Lys Tyr Leu Asp Phe Ala Phe Val Val Asp Ser Asn Asp Lys Pro

1 5 10 15

Cys Arg Pro Val Leu Asn Gly Tyr Ala Gly Trp Leu Leu Arg Ser Lys
20 25 30
Asn Ala Val Ile Ile Asn His Asp Pro Leu Val Ile Lys Arg Thr Asp

35 40 45
Asp Tyr Asn Ser Asp Ser Glu Asn Arg Lys Pro Ile Thr Cys Lys Met
50 55 60
Asp Met Gly Tyr Met Asn Ile Gly Phe Ser Val Gly Asp Glu Asp Asn
65 70 75 80
Glu Phe Leu Ala Gly Glu Val Lys Leu Leu Lys Gly Ile Ser Asp Arg
85 90 95
Ile Gln Ala Arg Ala Ser Tyr Arg Arg Thr Arg Arg Gly Arg Leu Arg

100 105 110
Tyr Arg Arg Asn Lys Asn Val Asp Tyr Lys Thr Val His Asn Pro Thr
115 120 125
Tyr Gln Asn Gly Asn Gln Asp Gly Trp Ile Ala Pro Ser Val Gln His
130 135 140
Lys Ile Asp Ser His Val Arg Leu Val Lys Lys Ile Ser Ser Trp Ile
145 150 155 160
Pro Ile Asp Lys Val Ile Ile Glu Ile Ala Ser Phe Asp Ile Gln Lys

165 170 175
Ile Lys Ala Glu Ile Asp Gly Lys Glu Ile Ser Gly Thr Asp Tyr Gln
180 185 190
His Gly Glu Met Tyr Gly Tyr Glu Asn Val Lys Gln Tyr Val Arg Glu
195 200 205
Arg Asp Lys Tyr Thr Cys Gln Leu Cys Gly Met Ser Gly Ile Gly Lys
210 215 220
Val Leu Glu Val His His Ile Ile Pro Arg Asn Ser Gly Gly Ser Asn

225 230 235 240
Lys Pro Ser Asn Leu Ile Cys Leu Cys His Asn Cys His Ile Asn Lys
245 250 255
Val His Ser Asn Lys Asn Asp Asn Lys Tyr Phe Arg Glu Leu Gln Asn

260 265 270

Arg Lys Ile Asn Asp Thr Tyr Lys Asp Ser Thr Phe Met Asn Thr Ala

275 280 285

Arg Trp Leu Ile Tyr Asn Ala Ile Gly Glu Ile Ile Val Asp Thr Tyr

290 295 300

Val Ser Phe Gly Tyr Ile Thr Lys Arg Asn Arg Glu Leu Ala Lys Leu

305 310 315 320

Pro Lys Phe His Tyr Val Asp Ala Ala Cys Ile Gly Glu Phe Thr Tyr

325 330 335

Lys Thr Leu Ser Gln Thr Ile Tyr Met Val Glu Gln Lys Arg Cys Asn

340 345 350

Asp Arg Cys Met Val Asp Phe Ser Asp Ala Lys Tyr Val Asp Thr Arg

355 360 365

Asp Gly Lys Val Lys Ser Gly Ser Asp Leu Ser Tyr Asn Arg Lys Pro

370 375 380

Thr Ala Arg Ser Lys Arg Ser Thr Gln Ser Glu Asp Ile Glu Asn Asn

385 390 395 400

Arg Val Phe Arg Gly Glu Lys Val Lys Asn Gly Val Val Arg Thr Ile

405 410 415

Asn His Ser Tyr Cys Leu Lys Ala Gly Asp Leu Ile Gln Ile Lys Val

420 425 430

Gly Lys Arg Lys Gly Ile Ile Cys Glu Val Thr Thr Met Gln Lys Arg

435 440 445

Gly Ser Asp Lys Tyr Asp Ile Tyr Phe Thr Tyr Glu Asn Lys Asp Val

450 455 460

Ala His Pro Ser Ile Lys Leu Ser Lys Glu Glu Tyr Tyr Asn Leu Lys

465 470 475 480

Ala Asn Gly Glu Cys Glu Lys Leu Lys Ile Ile Arg Thr Arg Arg Gly

485 490 495

Met Ile Trp Arg Lys Phe Asp Arg Thr Lys Tyr Glu Ser Glu His Lys

500 505 510

Asn Gln Tyr Asp Lys Cys Asn

515

<210> 660

<211> 410

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-557 effector

<400> 660

Met Phe Ile Tyr Val Leu Asn Met His Gly Glu Pro Leu Met Pro Cys

1 5 10 15

Lys Pro Arg Lys Ala Arg Ile Leu Leu Lys Glu Lys Lys Ala Lys Val

20 25 30

Val Asn Arg Thr Pro Phe Thr Ile Gln Leu Leu Tyr Gly Ser Ser Gly

35 40 45

Tyr Arg Gln Gln Ile Asn Leu Gly Ile Asp Ala Gly Ser Lys Tyr Val

50 55 60

Gly Leu Ser Ala Thr Thr Ser Lys Asn Glu Leu Phe Lys Ala Thr Val

65 70 75 80

Glu Leu Arg Gln Asp Ile Ser Lys Leu Leu Glu Ser Arg Arg Ser Gln

85 90 95

Arg Arg Ser Arg Arg Ser Arg Lys Leu Arg Tyr Arg Pro Ala Arg Phe

100 105 110

Asp Asn Arg Arg Asn Arg Lys Gly Lys Leu Ala Pro Ser Val Gln His

115 120 125

Lys Leu Asp Ser His Leu Thr Ile Ile Lys Lys Val Cys Gly Ile Ile

130 135 140

Pro Val Thr Asn Ile Ile Val Glu Thr Ala Glu Phe Asp Pro His Lys

145 150 155 160

Leu Lys Asn Pro Asn Val Glu Gly Val Gly Tyr Gln His Gly Asp Ala

165 170 175

Ala Gly Phe Tyr Asn Val Lys Ala Ala Val Leu Asn Arg Asp Asp Tyr

180 185 190

Ser Cys Gln Leu Cys Gly Val Lys Asp Thr Arg Leu Glu Val His His

195 200 205

Ile Arg Phe Arg Ser Gln Gly Gly Ser Asp Arg Met Asp Asn Leu Val

210 215 220

Thr Leu Cys Ser Asp Cys His Gly Lys Val His Ser Gly Glu Leu Thr

225 230 235 240

Phe Asp Lys Lys Phe Lys Ser Phe Lys His Ala Thr His Met Asn Ile

245 250 255

Met Arg Lys Gln Leu Val Glu Leu Leu Asn Asp Glu Phe Glu Cys Val

260 265 270

Phe Glu Thr Phe Gly Tyr Leu Thr Lys Tyr Asn Arg Glu Lys Leu Gly

275 280 285

Leu Gly Lys Ser His Ser Asn Asp Ala Phe Val Ile Ser His Asn Phe

290 295 300

Asn Ala Lys Gln Phe Asp Val Glu Phe Leu Phe Arg Lys Val Arg Arg

305 310 315 320

His Asn Arg Gln Leu His Lys Ser Lys Pro Ser Lys Gly Gly Lys Arg

325 330 335

Lys Arg Asn Gln Ser Ser Tyr Ile Val Asn Gly Phe Arg Arg Phe Asp

340 345 350

Lys Val Met Phe Asn Gly Val Glu Cys Phe Ile Thr Gly Lys Arg Ser

355 360 365

Ser Gly Tyr Phe Gln Leu Lys Lys Phe Asp Gly Thr Val Ile Ser Gln

370 375 380

Gly Ala Ser Ser Lys Lys Leu Lys Leu Leu Glu Pro Phe Lys Gly Trp

385 390 395 400

Leu Ile Asp Trp Arg Met Ala Asp Glu Tyr

405 410

<210> 661

<211> 427

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-558 effector

<400> 661

Met Gln Gln Gly Asn Arg Val Phe Val Leu Asn Met Arg Gly Glu Pro

1 5 10 15

Leu Met Pro Cys Ser Gln Arg Lys Ala Arg Ile Leu Leu Lys Glu Gly

20 25 30

Lys Ala Ile Ile Asn Lys Tyr Asn Pro Phe Thr Ile Gln Leu Thr Tyr

35 40 45

Ala Thr Gly Glu Thr Lys Gln Asp Cys His Ile Gly Val Asp Thr Gly

50 55 60

Ala Lys His Ile Gly Ile Ala Val Thr Ser Glu Asp Lys Ile Leu Tyr

65 70 75 80

Lys Ala Glu Ile Glu Leu Arg Gln Asp Val Ser Ser Asn Ile Asn Ser

85 90 95

Lys Arg Ile Tyr Arg Lys Ser Arg Arg Asn Arg Lys Cys Arg Tyr Arg

100 105 110

Lys Pro Arg Phe Leu Asn Arg Lys His Thr Asp Glu Trp Leu Pro Pro

115 120 125

Ser Leu Gln Asn Arg Ile Asn His Thr Phe Thr Trp Ile Asn Lys Phe

130 135 140

Ser Ala Leu Val Pro Asn Pro Ile Leu His Ile Glu Val Gly Lys Phe

145 150 155 160

Asp Thr Ala Lys Met Ile Asn Pro Asp Ile Asn Gly Val Asp Tyr Gln

165 170 175

Tyr Gly Gln Thr Tyr Gly Phe Phe Asp Glu Arg Tyr Phe Val Phe Ala

180 185 190

Arg Asp Asn Tyr Thr Cys Gln Val Cys Gly Lys Ser Lys Gly Lys Ile

195 200 205

Leu His Thr His His Ile Ile Tyr Arg Ser Asn Gly Gly Thr Asp Arg

210 215 220

Val Asp Asn Leu Ile Thr Val Cys Thr Asp Cys His Ile Ser Ala Asn

225 230 235 240

His Lys Lys Gly Gly Ile Leu Tyr Lys Trp Gln Ala Glu His Lys Lys

245 250 255

Val Lys Gln Tyr Lys Glu Pro Pro Phe Met Asn Thr Leu Arg Lys Arg

260 265 270

Ile Phe Ala Lys Tyr Pro Asn Ala Val Ile Thr Tyr Gly Ser Glu Thr

275 280 285

Thr Pro Lys Arg Lys Asp Ile Gly Leu Glu Lys Thr His Tyr Asn Asp

290 295 300

Ala Ile Val Ile Ser Gly Ile Lys Thr Ile Lys Glu Asn Pro Asp Glu

305 310 315 320

Trp Leu Leu Ile Arg Gln Phe Arg Lys Lys Lys Arg Ser Leu His Glu

325 330 335

Ala Thr Ala Arg Lys Gly Arg Arg Glu Pro Asn Arg Thr Gln Lys Arg

340 345 350

Asn Ser Lys Asn Thr Pro Phe Tyr Lys Gly Phe Trp Ile Asn Asp Lys

355 360 365

Val Ser Val Leu Gly Gln Phe Gly Tyr Ile Thr Gly Phe Ala Ser Gly

370 375 380

Gly Ala Tyr Ile Lys Asn Ser Asp Gly Glu Tyr Ile Thr Leu Pro Ser

385 390 395 400

Lys Ser Tyr Lys Gln Val Gly Leu Ala Asn Leu Arg Leu Val Ser His

405 410 415

Asn Asn Asn Trp Gln Tyr Ile Arg Asn Ala Val

420 425

<210> 662

<211> 419

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-559 effector

<400> 662

Met Phe Ile Tyr Val Leu Asn Lys Tyr Gly Lys Ala Leu Met Pro Cys
1 5 10 15

Lys Pro Arg Lys Ala Arg Leu Leu Leu Lys Glu Lys Lys Ala Lys Val

20 25 30

Val Asn Arg Thr Pro Phe Thr Ile Gln Leu Leu Tyr Gly Ser Ser Gly
35 40 45

Tyr Lys Gln Pro Val Asn Leu Gly Val Asp Ala Gly Ser Arg Tyr Val
50 55 60

Gly Leu Ser Ala Thr Thr Ser Lys Asn Glu Leu Phe Lys Ala Thr Val
65 70 75 80

Glu Leu Arg Gln Asp Ile Ser Lys Leu Leu Glu Ser Arg Arg Ser Gln

85 90 95

Arg Arg Ser Arg Arg Ser Lys Leu Arg Tyr Arg Pro Ala Arg Phe Asp
100 105 110

Asn Arg Arg Asn Arg Lys Gly Leu Leu Ala Pro Ser Val Gln His Lys
115 120 125

Val Asp Cys His Leu Thr Val Ile Arg Lys Val Cys Asn Ile Leu Pro
130 135 140

Val Asp Arg Ile Ile Val Glu Thr Ala Glu Phe Asp Pro His Lys Leu

145 150 155 160

Lys Asn Pro Cys Val Glu Gly Val Gly Tyr Gln Tyr Gly Asp Glu Ala

165 170 175

Gly Phe Tyr Asn Val Lys Ala Ala Val Leu Asn Arg Asp Thr Tyr Ser

180 185 190

Cys Gln Ile Cys Gly Ala Lys Asp Thr Arg Leu Glu Val His His Ile

195 200 205

Gln Phe Arg Ser Gln Gly Gly Ser Asp Arg Met Asp Asn Leu Val Thr

210 215 220

Leu Cys Lys Glu Cys His Gly Lys Val His Ser Gly Glu Leu Thr Phe

225 230 235 240

Asp Lys Glu Val Lys Ser Phe Lys His Ala Ser His Met Asn Val Met

245 250 255

Arg Lys Arg Leu Val Glu Leu Leu Lys Met Glu Phe Gly Cys Val Val

260 265 270

Glu Thr Phe Gly Tyr Leu Thr Lys Phe Thr Arg Glu Lys Leu Gly Leu

275 280 285

Cys Lys Ser His Cys Ile Asp Ala Phe Val Ile Ser His Asn Leu Glu

290 295 300

Ala Glu Pro Leu Asp Val Glu Phe Arg Phe Arg Lys Val Arg Arg His

305 310 315 320

Asn Arg Gln Leu His Lys Ala Lys Pro Ser Lys Gly Gly Lys Arg Arg

325 330 335

Ser Asn Gln Ser Lys Tyr Ile Val Asn Gly Phe Arg Arg Phe Asp Lys

340 345 350

Val Met Tyr Glu Gly Val Glu Cys Phe Ile Thr Gly Lys Arg Ser Ser

355 360 365

Gly Tyr Phe Gln Leu Lys Thr Leu Asp Gly Ala Val Ile His Gln Gly

370 375 380

Val Ser Ser Lys Gln Leu Arg Leu Leu Glu Pro Val Lys Gly Trp Leu

385 390 395 400

Ile Asp Trp Arg Val Ala Ile Pro Pro Arg Pro Lys Glu Val Glu Val

405 410 415

Ser Leu Pro

<210> 663

<211> 434

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-560 effector

<400> 663

Met Val Tyr Val Leu Ser Ala Ser Gly Asn Pro Leu Met Pro Thr Glu
1 5 10 15

Arg His Gly Arg Val Arg His Leu Leu Asp Arg Arg Glu Ala Arg Val
20 25 30

Val Arg Arg Thr Pro Phe Thr Ile Gln Leu Thr Tyr Glu Thr Glu Glu
35 40 45

Arg Thr Gln Pro Ile Thr Leu Gly Ile Asp Ala Gly Ser Lys Thr Val
50 55 60

Gly Ile Ser Ala Ala Thr Lys Ser Lys Glu Val Phe Ala Ala Glu Leu
65 70 75 80

Thr Pro Arg Asn Asp Val Val Lys Leu Leu Ser Lys Arg Arg Glu Leu
85 90 95

Arg Arg Ala Arg Arg Ser Arg Thr Thr Arg His Arg Glu Pro Arg Phe
100 105 110

Asp Asn Arg Thr His Ser Lys His Lys Gly Trp Leu Ala Pro Ser Val
115 120 125

Glu Val Lys Ile His Asn His Ile Gln Gly Ile Arg Leu Ala Thr Arg
130 135 140

Val Leu Pro Ile Ala Gly Ile Val Ile Glu Thr Gly Glu Phe Asp Leu
145 150 155 160

Gln Arg Leu Lys Ala Met Glu Glu Gly Arg Pro Leu Pro Val Gly Thr
165 170 175

Asp Tyr Gln Leu Gly Glu Met Tyr Asp Glu Tyr Asn Val Arg Gln Tyr

180 185 190

Val Leu His Arg Asp Gly Tyr Cys Cys Arg Lys Cys Arg Ala Lys Gly

195 200 205

Asp Gly Ile Lys Leu His Val His His Leu Glu Ser Arg Gln Thr Gly

210 215 220

Gly Asn Arg Pro Ala Asn Leu Ile Thr Leu Cys Glu Thr Cys His Lys

225 230 235 240

Lys Tyr His Glu Gly Lys Ile Ser Leu Asp Gly Ala Lys Pro Gly Arg

245 250 255

Asn Tyr Arg Asp Ala Ala Phe Met Gly Ile Met Arg Pro Thr Leu Met

260 265 270

Ala Arg Val Arg Ala Glu Phe Pro Asn Val Pro Ile Lys Glu Thr Lys

275 280 285

Gly Tyr Ile Thr Lys Phe Val Arg Glu Leu Asn Gly Ile Val Lys Ser

290 295 300

His Ile Asn Asp Ala Arg Cys Ile Gly Gly Asn Pro Tyr Ala Lys Ser

305 310 315 320

Ser Gly Glu Val Tyr Arg Leu Lys Pro Val Arg Ala His Asn Arg Lys

325 330 335

Leu His Lys Glu Thr Ile Leu Lys Gly Gly Tyr Arg Lys Ala Asn Gln

340 345 350

Ala Pro Lys Lys Met Phe Gly Tyr Arg Leu Phe Asp Lys Val Leu Cys

355 360 365

Asn Gly Glu Glu Gly Phe Ile Phe Gly Arg Arg Ser Ser Gly Ser Phe

370 375 380

Asp Ile Arg Thr Leu Asp Gly Asn Arg Leu Ser Ala Gly Ile Ser Tyr

385 390 395 400

Lys Lys Leu Ser Leu Lys Glu Asn Ala Thr Asn Val Leu Ile Glu Arg

405 410 415

Arg Lys Ala Ile Pro Pro Pro Pro Val Glu Val Gly Val Ser Ser Pro

420 425 430

Ile Phe

<210> 664

<211> 436

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-561 effector

<400> 664

Met Thr Lys Thr Leu Thr Thr Gln Thr Thr Gln Ala Cys Val Leu Asp

1 5 10 15

Gln Asn Gly Lys Pro Leu Met Pro Thr Thr Arg Leu Gly Lys Val Tyr

20 25 30

Arg Leu Leu Lys Thr Lys Lys Ala His Ile Val Ser Tyr Glu Pro Phe

35 40 45

Thr Ile Gln Leu Asp Tyr Glu Pro Asn Thr His Ile Ile Gln Pro Met

50 55 60

Thr Leu Gly Val Asp Ser Gly Ala Ile His Ser Gly Tyr Ser Val Thr

65 70 75 80

Asn Glu His Arg Glu Tyr Tyr Asn Ala Glu Val Ile Ala Arg Asn Asp

85 90 95

Ile Ser Arg Asn Leu Ser Asn Arg His Met Tyr Arg Arg Thr Arg Arg

100 105 110

Thr Arg Lys Thr Arg Tyr Arg Lys Pro Arg Phe Asn Asn Arg Lys Asn

115 120 125

Lys Lys Lys Gly Trp Leu Ala Pro Ser Leu Gln Gln Lys Ile Ala Val

130 135 140

Gln Leu Asn Glu Ile Asp His Leu His Arg Tyr Phe Pro Ile Glu Thr

145 150 155 160

Ile Ile Val Glu Val Ala Glu Phe Asp Ile Gln Lys Ile Lys Asn Pro

165 170 175

Asp Ile Ser Gly Ile Glu Tyr Gln Gln Gly Thr Leu Gln Gly Tyr Asn

180 185 190

Ile Arg Asn Tyr Leu Leu Glu Lys His Gly His Lys Cys Phe Tyr Cys

195 200 205

Gly Lys Thr Val Ser Asp Phe Glu Val Glu His Met Leu Pro Lys Ser

210 215 220

Arg Gly Gly Ser Asn Arg Ile Asp Asn Leu Thr Leu Ser Cys His Asp

225 230 235 240

Cys Asn Glu Lys Lys Gly Thr Leu Thr Ala Glu Glu Phe Ile Gln Gln

245 250 255

Thr Leu Ser Ala Lys Lys Ala Val Ser Lys Leu Lys Gln Leu Pro Asn

260 265 270

Glu Lys Arg Leu Phe Lys Tyr Met Thr Tyr Met Asn Ala Thr Arg Trp

275 280 285

Ala Leu Tyr Asp Ala Ile Asn Gly Thr Tyr Arg Asn Val Lys Met Thr

290 295 300

Tyr Gly Tyr Ile Thr Lys Tyr Asn Arg Ile His Ala Gly Leu Pro Lys

305 310 315 320

Ala His His Ile Asp Ala Lys Cys Ile Thr Gly Phe Leu Thr Ile Pro

325 330 335

Ser Met Ser Gln Thr Val Val Lys Val Lys Met Arg Arg His Asn Arg

340 345 350

Gln Leu His Arg Ala Ser Phe Ser Lys Gly His Ile Arg Lys Ile Ala

355 360 365

Cys Leu Pro Thr Thr Val Phe Gly Phe Gln Leu Tyr Asp Leu Val Cys

370 375 380

Phe Asn Asn His Arg Tyr Tyr Ile Lys Ser Arg Arg Ser Ser Gly Ala

385 390 395 400

Phe Thr Leu Ala Ser Val Glu Gly Leu Lys Asn Glu Lys Arg Thr Tyr

405 410 415

Lys Lys Leu Thr Leu Leu Ala His Thr Asn Ala Tyr Leu Thr Asn Arg
420 425 430

Tyr Ile Asn Ala
435

<210> 665

<211> 415

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-562 effector

<400> 665

Met Arg Val Phe Val Ile Asn Gln Arg Gln Glu Pro Leu Met Pro Cys

1 5 10 15

Ser Pro Arg Lys Ala Arg Met Leu Leu Arg Glu Gly Lys Ala Lys Val
20 25 30

Thr Lys Arg Met Pro Phe Thr Ile Gln Leu Thr Ile Ala Thr Gly Glu
35 40 45

Thr Lys Gln Glu Ile Thr Ile Gly Ile Asp Ala Gly Ser Lys Thr Ile
50 55 60

Gly Val Ser Ala Thr Thr Asp Lys Glu Glu Leu Phe Ser Ala Glu Val

65 70 75 80

Glu Leu Arg Asn Asp Ile Val Asp Leu Leu Ser Thr Arg Arg Gln Asn
85 90 95

Arg Arg Ala Arg Arg Asn Arg Leu Arg Tyr Arg Lys Pro Arg Phe Leu
100 105 110

Asn Arg Val Lys Ser Lys Lys Lys Gly Trp Leu Ala Pro Ser Ile Gln
115 120 125

Asn Lys Ile Glu Thr His Leu Lys Val Val Ser Leu Ile Tyr Lys Ile

130 135 140

Leu Pro Ile Ser Lys Thr Ile Val Glu Val Ala Ser Phe Asp Ile Gln

145 150 155 160

Lys Ile Lys Asn Pro Glu Ile Ser Gly Lys Glu Tyr Gln Glu Gly Glu

165 170 175

Gln Leu Gly Phe Trp Asn Val Arg Glu Tyr Val Leu Phe Arg Asp Gly

180 185 190

His Lys Cys Gln Gly Lys Ala Gly Cys Lys Asn Lys Ile Leu Asn Val

195 200 205

His His Ile Glu Ser Arg Lys Ile Gly Gly Asp Ser Pro Gly Asn Leu

210 215 220

Ile Thr Leu Cys Glu Asp Cys His Asn Asn Tyr His Thr Gly Lys Leu

225 230 235 240

Lys Leu Asn Leu Lys Arg Gly Gln Ser Phe Arg Asp Ala Ala Phe Met

245 250 255

Gly Ile Met Arg Trp Ala Phe Tyr Asn Lys Leu Lys Glu Leu Tyr Pro

260 265 270

Asn Val Lys Leu Thr Tyr Gly Tyr Ile Thr Lys Asn Thr Arg Ile Arg

275 280 285

Asn Asn Leu Pro Lys Glu His Arg Val Asp Ala Leu Cys Ile Thr Gly

290 295 300

Lys Pro Leu Val Lys Arg Leu Asp Asn Trp Tyr Phe Val Lys Lys Val

305 310 315 320

Arg Cys His Asn Arg Gln Ile His Lys Ala Asn Ile Leu Lys Gly Gly

325 330 335

Asn Lys Lys Leu Asn Gln Ala Gln Phe Glu Val Lys Gly Phe Arg Leu

340 345 350

Phe Asp Lys Val Arg Tyr Gln Ser Lys Glu Tyr Phe Ile Phe Gly Arg

355 360 365

Arg Asn Ser Gly Phe Phe Asp Ile Arg Thr Leu Ser Gly Glu Lys Val

370 375 380

Asn Lys Gly Ser Val Asn Cys Asn Lys Leu Lys Leu Ile Gly Phe Arg

385 390 395 400

Lys Asn Met Leu Trp Glu Arg Arg Met Ala Ile Pro Pro Leu Pro
405 410 415

<210> 666

<211> 420

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-563 effector

<400> 666

Met Val Tyr Val Ile Asn Phe Asp Gly Thr Pro Leu Met Pro Cys Thr
1 5 10 15

Ser Val Ile Ala Arg Leu Leu Leu Lys Gln Gly Lys Ala Lys Cys Ile
20 25 30

Lys Arg Thr Pro Phe Thr Ile Lys Leu Leu Tyr Gln Thr Thr Asn Tyr
35 40 45

Thr Gln Tyr Leu Thr Leu Gly Ile Asp Thr Gly Ser Ser Lys Ile Gly
50 55 60

Ser Ala Val Val Ser Asp Asn Gly Gly Val Leu Tyr Leu Ser Glu Val
65 70 75 80

Lys Ile Arg Asn Asp Ile Thr Asp Lys Met Lys Gln Arg Ser Lys Tyr
85 90 95

Arg Arg Asn Arg Arg Asn Arg Lys Thr Arg Tyr Arg Lys Ala Arg Trp
100 105 110

Ala Asn Arg Lys Asn Ser Ile Arg Thr Val Arg Phe Ser Pro Thr Met
115 120 125

Val Ser Lys Ile Asn Ser His Ile Arg Glu Tyr Asn Phe Val Asn Ser
130 135 140

Ile Leu Pro Ile Lys His Thr Ile Leu Glu Thr Ala Thr Phe Asp Ala
145 150 155 160

His Ala Leu Lys Asn Pro Thr Val Leu Ser Asn Lys Trp Leu Tyr Gln

165 170 175

Lys Gly Ile Asn Tyr Gly Phe Ala Asn Thr Lys Ala Tyr Val Leu Asn

180 185 190

Arg Asp Asn His Thr Cys Gln His Cys Lys Gly Lys Thr Lys Asp Ser

195 200 205

Lys Leu Glu Val His His Ile Thr Phe Arg Arg Asn Gly Gly Ser Asp

210 215 220

Asp Ser Glu Asn Leu Lys Thr Leu Cys Lys Thr Cys His Asp Asn Leu

225 230 235 240

His Ser Gly Leu Val Lys Leu Thr Gly Gly Lys Ser Lys Gly Gln Leu

245 250 255

Lys His Ala Thr Gln Met Asn Ser Ile Arg Thr Gln Leu Leu Asn Ile

260 265 270

Leu Pro Phe Val Glu Glu Thr Phe Gly Phe Val Thr Lys Glu His Arg

275 280 285

Gln Leu Leu Asn Leu Pro Lys Glu His Tyr Met Asp Ala Ile Ala Ile

290 295 300

Ala Ser Gln Gly Lys Tyr Val Val Phe Lys Thr Gln Glu Val Ile Leu

305 310 315 320

Lys Lys Cys Val Ser Gln Gly Asp Tyr Gln Gln Thr Lys Gly Val Arg

325 330 335

Ser Glu Gln Arg Ile Pro Thr Asn Lys Ile Gln Gly Phe Arg Lys Phe

340 345 350

Asp Lys Val Lys Tyr Leu Gly His Glu Tyr Phe Ile Lys Gly Arg Met

355 360 365

Ser Thr Gly Tyr Val Ile Leu Met Asp Ile Glu Gly Asn Lys Ile Glu

370 375 380

Phe Ser Asn Ala Pro Lys Gly Met Lys Thr Ala Lys Thr Lys Asn Leu

385 390 395 400

Thr Arg Ile Ser Ser Arg Asn Thr Trp Leu Thr Gln Ala Arg Pro Leu

405 410 415

Gln Phe Ile Pro
420

<210> 667

<211> 516

<212> PRT

<213> Unknown

<220><223> Description of Unknown:
uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-564 effector

<400> 667

Met Lys Tyr Leu Asp Tyr Thr Phe Val Val Asp Asn Asn Asn Val Pro
1 5 10 15

Cys Met Pro Val Thr Asn Asn Glu Ala Gly Tyr Leu Ile Arg Cys Gly
20 25 30

Leu Ala Lys Val Ile Asn His Asp Pro Phe Val Ile Gln Arg Leu Asp
35 40 45

Asp Tyr Ile Ser Glu Ser Glu Ile Arg Asp Glu Ile Thr Met Lys Met
50 55 60

Asp Met Gly Tyr Met Asn Val Gly Phe Ser Val Gly Thr Lys Asp His
65 70 75 80

Glu Tyr Leu Ser Gly Gln Val Lys Leu Leu Asn Gly Ile Ser Glu Arg
85 90 95

Leu Glu Gln Arg Ala Ser Tyr Arg Arg Thr Arg Arg Gly Arg Ile Arg
100 105 110

Tyr Arg Lys Asn Lys Asn Val Asp Tyr Lys Thr Ile His Asn Pro Thr
115 120 125

Tyr Lys Asn Gly Asn Glu Asp Asn Trp Ile Ala Pro Ser Val Gln His
130 135 140

Lys Ile Asp Ser His Val Arg Leu Tyr Arg Lys Ile Ala Ser Trp Ile
145 150 155 160

Pro Ile Asp Lys Ile Ile Ile Glu Ile Ala Asn Phe Asp Ile Gln Ala

165 170 175

Ile Lys Ala Leu Lys Asp Gly Lys Glu Ile Ser Gly Val Asp Tyr Gln

180 185 190

Arg Gly Glu Met Tyr Gly Phe Glu Asn Val Lys Gln Tyr Val Arg Glu

195 200 205

Arg Asp Asn Tyr Thr Cys Gln Ile Cys Glu Thr Asp Thr Ile Lys Lys

210 215 220

Gly Thr Gly Leu Glu Val His His Ile Ile Pro Arg Ser Gln Gly Gly

225 230 235 240

Ser Asn Lys Pro Ser Asn Leu Ile Ser Leu Cys Lys Lys Cys His Asn

245 250 255

Lys Val His Ser Asn Asn Asn Asn Asn Lys Tyr Phe His Glu Leu Gln

260 265 270

Thr Arg Lys Ile Asn Asp Thr Tyr Lys Asp Ala Thr Phe Met Asn Thr

275 280 285

Ser Arg Trp Arg Ile Tyr Glu Ser Ile Gly Ser Lys Cys Pro Thr Tyr

290 295 300

Ile Ser Tyr Gly Tyr Ile Thr Ser Leu Asn Arg Lys Thr Asn Asn Leu

305 310 315 320

Pro Lys Phe His Tyr Val Asp Ala Ala Cys Ile Gln Lys Phe Thr Tyr

325 330 335

Lys Thr Leu Thr Lys Asn Ile Tyr Leu Val Glu Gln Lys Arg Cys Asn

340 345 350

Asp Arg Cys Met Ser Thr Phe Trp Asp Ala Lys Tyr Ile Asp Asn Arg

355 360 365

Asp Gly Lys Glu Lys Lys Gly Ser Glu Leu Ser Tyr Lys Arg Leu Pro

370 375 380

Ser Ala Thr Ser Lys Arg Thr Thr Arg Lys Glu Asp Val Glu Asn Asp

385 390 395 400

Arg Val Tyr Arg Gln Arg Lys Thr Lys Lys Gly Glu Phe Arg Phe Val

405 410 415

Cys Asn Ser Arg Cys Leu Lys Ala Gly Asp Leu Ile Arg Ile Asn Ile
420 425 430

Gly Lys Arg Lys Gly Ile Ile Gly Glu Val Thr Asn Ser Gln Ile Glu
435 440 445

Arg Asn Lys Tyr Lys Val Arg Phe Thr Tyr Asp Gly Gln Asp Val Lys
450 455 460

Tyr Pro Ser Ile Ser Ile Ser Lys Asp Glu Tyr Asn Ile Leu Lys Glu
465 470 475 480

Thr Gly Lys Cys Asp Ser Ile Ser Ile Val Arg Thr Arg Arg Gly Met
485 490 495

Ile Trp Arg Lys Tyr Asp Arg Ala Lys Tyr Glu Ser Glu Asn Val Asp
500 505 510

Gln Tyr Ser Ser
515

<210> 668

<211> 412

<212> PRT

<213> Unknown

<220><223> Description of Unknown:

uncultivated organism

<220><223> Category: MG35 effectors

<220><223> Description: MG35-565 effector

<400> 668

Met Asn Glu Val Lys Thr Ile Lys Pro Val Ile Asn His Val Phe Val
1 5 10 15

Gln Asn Val His Gly Asn Pro Leu Met Pro Thr Thr Gln Ala Lys Ala
20 25 30

Arg His Leu Leu Lys Ala Glu Lys Ala Arg Val Val Ser Lys Cys Pro
35 40 45

Tyr Thr Ile Lys Leu Arg Phe Pro Cys Lys Asn Glu Val Gln Ser Val
50 55 60

Val Ala Ala Cys Ile Pro Ser Ser Tyr Val Ile Gly Ile Ala Ala Lys

65 70 75 80

Cys Gly Glu Val Cys Leu Phe Ser Ser Ala Thr Glu Pro Arg Thr Asn

85 90 95

Val Ser Gly Asn Met Glu Lys Arg Ser Asn Tyr Arg Arg Thr Arg Arg

100 105 110

Asn Arg Lys Thr Arg Tyr Arg Gln Ala Arg Phe Asn Asn Arg Ile Arg

115 120 125

Asn Trp Leu His Asn Pro Thr Ile Asn Ser Lys Leu Gln Ser His Leu

130 135 140

Arg Glu Ile Lys Arg Val Gln Ser Ile Leu Pro Ile Ala Ser Trp Tyr

145 150 155 160

Thr Val Lys Ser Ala Thr Ala Glu Glu Trp Asn Gly Lys Pro Asp Glu

165 170 175

Lys Trp Leu Asn Ile Gln Ser Lys Val Phe Lys Arg Asp Gly Tyr Lys

180 185 190

Cys Arg Cys Cys Lys Ala Gly Arg Thr Glu Leu His Ala His His Ile

195 200 205

Ile Pro Arg Ser Gln Asn Gly Pro Asp Thr Leu Thr Asn Leu Val Thr

210 215 220

Leu Cys Lys Lys Cys His Val Asp Leu His Lys Gly Val Ser Ile Lys

225 230 235 240

Ile Gly Asn Val Val His Lys Thr Ala Lys Gln Asp Thr Val Cys Ala

245 250 255

Ile Ile Arg Lys Tyr Leu Asp Phe Lys Asn Val Pro Val Gln Asn Ile

260 265 270

Tyr Gly Phe Gln Val Lys Ala Gln Arg Ile Lys Leu Asn Leu Pro His

275 280 285

Ser Ala Leu Asn Asn Ala Ser Ala Ala Leu Asn Val Gln Pro Ala Asn

290 295 300

Cys Phe Thr Leu Lys Asn Val Ala Gly Gly Asp Tyr Gln Gln Asn Lys

305 310 315 320

Gly Arg Arg Ser Glu Ile Lys Ile Pro Thr Gly Lys Leu His Gly Phe
325 330 335
Arg Lys Phe Asp Lys Val Leu Tyr Lys Gly Lys Ile Ala Phe Val Met
340 345 350
Gly Lys Arg Thr Ser Gly Ala Phe Ile Leu Met Asp Val His Gly Lys
355 360 365

Lys Leu Glu Phe Arg Pro Asp Pro Arg Val Lys Asn Leu Val Arg Val
370 375 380
Thr Ala Arg Ser Thr Thr Leu Ile Val Asn Asn Ala Asn Asn Cys His
385 390 395 400
Ser Thr Asn Asp Phe Pro Gln Lys Ile Lys Thr Gln
405 410

<210> 669

<211> 174

<212> DNA

<213> Artificial Sequence

<220><223> Description of Artificial Sequence: Synthetic polynucleotide

<

220><223> Category: MG33 tracrRNA

<220><223> Description: MG33-2 tracrRNA 1

<400> 669

tacctttctg gtaatttccg ccccctagag tgaaagaagc ccaggcgccg ccgttctcgc 60

cactgtagcc cagcagcgga ttcaggcata ggcggcccct tctggtactc ggtgagccag 120

gcgacccgca agggttgagg gtaagggcgc ggtggagccg accgggcggt gacc 174

<210> 670

<211> 144

<212> DNA

<213> Artificial Sequence

<220><223> Description of Artificial Sequence: Synthetic polynucleotide

<220><223> Category: MG33 tracrRNA

<220><223

> Description: MG33-2 tracrRNA 2

<400> 670

tacctttctg gtaatttccg ccccctagag tgaaagaagc ccaggcgccg ccgttctcgc 60

cactgtagcc cagcagcgga ttcaggcata ggcggcccct tctggtactc ggtgagccag 120

gcgacccgca agggttgagg gtaa 144

<210> 671

<211> 128

<212> DNA

<213> Artificial Sequence

<220><223> Description of Artificial Sequence: Synthetic polynucleotide

<220><223> Category: MG33 tracrRNA

<220><223> Description: MG33-3 tracrRNA 1

<400> 671

taattgtcga ttgtaagaag ctcaggcgtg tggcagctcg cctctgttag gctccagcag 60

aggatttagc agggattaaa aatcccaaat gcccgccccg ttataaaagc gaagagccat 120

tcatcttt 128

<210> 672

<211> 141

<212> DNA

<213> Artificial Sequence

<220><223> Description of Artificial Sequence: Synthetic polynucleotide

<220><223> Category: MG102 tracrRNA

<220><223> Description: MG102-1 tracrRNA 1

<400> 672

tgttcgggtt caagctgaaa agagcatctg tccggaaggg ccactccggg ttagggcaga 60

cccggctctt gggcttcctt ggtcttttga ctctggagga aaccttccgg cgtgtcgcaa 120

gacaagatgt gagcctattt t 141

<210> 673

<211> 156

<212> DNA

<213> Artificial Sequence

<220><223> Description of Artificial Sequence: Synthetic

polynucleotide

<220><223> Category: MG102 tracrRNA

<220><223> Description: MG102-2 tracrRNA 1

<400> 673

gacaattcag aaaaaaatat cagttccggt tgaaaagagc atccgtccgg agggtgcact 60

ccgggatggg gcagtcccgg cacttgcgtt ttccccggct tacgcttcgg aaaaaggccc 120

ttcggcacgt cgaaagacag gatgtgagcc caattt 156