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(54) Title: COVALENT POLYMER-ANTIGEN CONJUGATED PARTICLES

(57) Abstract: The present invention provides compositions comprising tolerizing immune modified particles (TIMPs) and methods for using and making said TIMPs. In particular, carrier polymer is covalently conjugated with antigenic peptide before particle formation, which allows for exquisite control of particle size and antigen encapsulation (e.g., for use in eliciting induction of immunological tolerance).

WO 2017/112899 A1

COVALENT POLYMER-ANTIGEN CONJUGATED PARTICLES

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Application No. 62/387,183, filed December 23, 2015 and U.S. Provisional Application No. 62/292,098, filed February 5, 2016, the contents of each of which are incorporated herein by reference in their entirety.

DESCRIPTION OF THE TEXT FILE SUBMITTED ELECTRONICALLY

[0002] The contents of the text file submitted electronically herewith are incorporated herein by reference in their entirety: A computer readable format copy of the Sequence Listing (filename: COUR-011_00US_Seqlist.txt, date recorded: December 23, 2015, file size 1.16 MB).

BACKGROUND OF INVENTION

[0003] Inflammatory diseases and disorders are conditions in which an abnormal or otherwise deregulated inflammatory response contributes to the etiology or severity of disease. Examples include autoimmune diseases such as type 1 diabetes and Celiac disease.

[0004] Many of these diseases are characterized by a mononuclear cell infiltration at a site of tissue injury or other insult. Examples of mononuclear cells that have been observed in these infiltrations include lymphocytes, especially T lymphocytes, and cells of the mononuclear phagocyte system (MPS cells) such as monocytes, macrophages, dendritic cells, microglial cells and others.

[0005] Many of the cells observed in the mononuclear cell infiltrates are suspected of having a role in these abnormal inflammatory responses. For example, in diseases such as multiple sclerosis, $CD4^+$ T cells are known to play a central role in the pathologic autoimmune response. At an earlier time point in T cell activation, dendritic cells and other MPS cells may be responsible for activation of $CD4^+$ T cells. MPS cells could also contribute to inflammation through phagocytosis although in at least some inflammatory diseases it is not clear whether such cells would be capable of this in the absence of $CD4^+$ T cells.

[0006] Peripheral blood monocytes may be classified into one of two groups according to the expression or not of certain cell surface molecules. In particular, human "resident monocytes" or "mature monocytes" are understood to have a $CD14^{lo}CD16^+$ phenotype (the mouse counterpart is $CX_3CR1^{hi}CCR2^-Gr1^-$). Another group of cells, the "inflammatory monocytes"

or "immature monocytes" are understood to have a $CD14^{+}CD16^{-}$ phenotype (the mouse counterpart is $CX_3CR1^{lo}CCR2^{+}Gr1^{+}$). (Geissmann F. et al. 2003 Immunity 19: 71-82)

[0007] Importantly, while the latter are understood to be "inflammatory" in the sense that they are observed to migrate into inflamed tissue from bone marrow derived peripheral blood cells, these cells have not been shown to cause inflammation either directly or through the action of other cells. Further, the various MPS cells that may be formed when these cells differentiate have also not been shown to cause inflammation.

[0008] Conventional clinical strategies for general long-term immunosuppression in disorders associated with an undesired immune response are based on the long-term administration of broad acting immunosuppressive drugs, for example, signal 1 blockers such as cyclosporin A (CsA), FK506 (tacrolimus) and corticosteroids. Long-term use of high doses of these drugs can have toxic side-effects. Moreover, even in those patients that are able to tolerate these drugs, the requirement for life-long immunosuppressive drug therapy carries a significant risk of severe side effects, including tumors, serious infections, nephrotoxicity and metabolic disorders.

[0009] Methods of inducing antigen-specific tolerance have been developed, including cell coupling of an antigen or peptide. For example, in one method, peptide induced cell coupled tolerance involved collection, separation and treatment of peripheral blood cells with disease specific autoantigens and the ethylene carbodiimide (EDCI) coupling reagent under sterile conditions, and subsequent re-infusion into the donor/patient. This process is costly and must be conducted under closely monitored conditions by skilled practitioners and is limited in the number of centers that can conduct the procedure. The use of red blood cells as the donor cell type expands the potential source to include allogeneic donors thus increasing the supply of source cells dramatically and potentially expanding the delivery of this therapy to any setting certified for blood transfusion. These approaches have significant limitations in terms of supply of source cells and necessity for tissue type matching to minimize immune response to the donor cells. In addition the local treatment of the cells to couple autoantigens via EDCI presents a significant quality control issue. Furthermore, these approaches also require at least some knowledge of the pathological antigen for which immune tolerance is sought.

[0010] Antigen-specific tolerance is generally not ideal because specific antigens/epitopes are generally not known in human diseases. Furthermore, antigens can vary from subject to subject. In order for an antigen specific approach to be effective, therefore, it would be necessary to determine which antigens each individual patient would recognize, or it would require coupling a library of possible peptides to the particles prior to administration.

[0011] Recently, peptide-coupled particles have been described which eliminates the requirement for a supply of source cells and circumvents the tissue-typing requirement of the prior approaches, *See* WO 2010/085509; US 2012/0076831; and US 2016/0166664, the contents of which are incorporated by reference herein in their entirety. Notwithstanding, the use of antigens coupled to the outside of particles is associated with increased anaphylaxis and has significant chemistry, manufacturing and control issues.

[0012] When the antigen is encapsulated within the particle, these adverse events are avoided, *See* WO 2013/192532; US 2015/0209293; WO 2015/023796; US 2015/0190485; and US 2015/0283218, the contents of both of which are herein incorporated by reference in their entireties. Further the size and the charge can be altered to enhance tolerance to specific antigens. The problem with antigen encapsulation within nanoparticles, however, is the ability to control the loading of the antigens as well as the release of the antigen. Currently, the amount of antigen goes into each particle cannot be precisely controlled. Similarly, the amount of antigen released is also not tightly controlled leading to the potential for a burst release effect under certain conditions where a slower more controlled release may be desirable. The present invention provides a process where particle size and antigen encapsulation as well as antigen release can be precisely controlled.

SUMMARY OF THE INVENTION

[0013] The present disclosure is directed to tolerizing immune modified particles (TIMPs) in which encapsulated antigens are covalently attached to the internal surface. The covalent coupling to the internal particle surface allows for exquisite control of particle size and antigen encapsulation efficiency while at the same time reducing the risk antigen burst effects and avoiding unwanted side effects associated with surface coupled peptides.

[0014] The present disclosure provides a composition comprising one or more antigens covalently attached to a carrier particle having a negative zeta potential, wherein said one or more antigens is encapsulated in said particle.

[0015] The present disclosure provides a composition comprising one or more antigens encapsulated within a polymeric carrier particle, wherein said one or more antigens is covalently attached to a polymer that makes up said polymeric carrier particle.

[0016] In some embodiments, the composition further comprises an unconjugated carrier polymer. In some embodiments, the composition further comprises a pharmaceutically acceptable carrier.

[0017] In some embodiments, the present invention provides compositions (e.g., for induction of antigen-specific tolerance) comprising a carrier particle (e.g., PLG particle) covalently attached to one or more antigenic peptides, wherein said one or more antigenic peptides is encapsulated in said carrier particle. In certain embodiments, the carrier particle is a poly(lactide-*co*-glycolide) (PLG) particle. In other embodiments, the carrier particle is a PLURONIC® stabilized polypropylene sulfide particle.

[0018] In some embodiments, the present invention provides compositions comprising: an antigen coupled to a carrier particle having a negative zeta potential. In some embodiments, the zeta potential of the particle is less than about -100 mV. In some embodiments, the zeta potential of the particle is between about -100 mV and about -15 mV. In some embodiments, the zeta potential of the particle is between about -100 mV and about -75 mV. In some embodiments, the zeta potential of the particle is between about -50 mV and about -20 mV. In some embodiments, the particle is a co-polymer having a molar ratio from about 50:50, 80:20 to about 100:0. In some embodiments, the co-polymers ratio may be, but not limited to, polystyrene: poly(vinyl carboxylate)/80:20, polystyrene: poly(vinyl carboxylate)/90:10, poly(vinyl carboxylate): polystyrene/80:20, poly(vinyl carboxylate): polystyrene/90:10, polylactic acid: polyglycolic acid/80:20, or polylactic acid: polyglycolic acid/90:10, or polylactic acid: polyglycolic acid/50:50. Yet in other embodiments, the particle is a polystyrene particle, a carboxylated polystyrene particle, PLURONIC® stabilized polypropylene sulfide particle, or a poly(lactic-co-glycolic acid) particle. In some embodiments, the particle is a poly(lactic-co-glycolic acid) particle.

[0019] In some embodiments, the particle has an average diameter of between about 0.1 μm to about 10 μm. In some embodiments, the particle has an average diameter of between 0.2μm and about 2μm. In some embodiments, the particle has an average diameter of between about 0.3 μm to about 5 μm. In some embodiments, the particle has an average diameter of between about 0.5 μm to about 3 μm. In some embodiments, the particle has an average diameter of between about 0.5 μm to about 1 μm. In some embodiments, the particle has an average diameter of about 0.5 μm.

[0020] In further embodiments, the one or more antigens comprises at least a portion of an autoimmune antigen, allergens, an antigen expressed on a tissue to be transplanted into a subject, an enzyme for enzyme replacement therapy, or an allergen. In some embodiments, the antigen comprises at least a portion of myelin basic protein, acetylcholine receptor, endogenous antigen, myelin oligodendrocyte glycoprotein, pancreatic beta-cell antigen, insulin, proinsulin, islet-specific glucose-6-phophatase catalytic subunit-related protein

(IGRP), glutamic acid decarboxylase (GAD), collagen type 11, human cartilage gp39, fp130-RAPS, proteolipid protein, fibrillarin, small nucleolar protein, thyroid stimulating factor receptor, histones, glycoprotein gp70, pyruvate dehydrogenase dehydrolipoamide acetyltransferase (PCD-E2), hair follicle antigen, aqua porin 4, Desmoglein 1, Desmoglein 3, nicotinic acetylcholine receptor, A-gliaden, and human tropomyosin isoform 5, Bahia grass pollen (BaGP), peach allergen Pru p 3, alpha s 1-Caein Milk allergen, Apig1 celery allergen, Bere1 Brazil nut allergen, B-Lactoglobulin Milk allergen, Bovine serum albumin, Cor a 1.04 Hazelnut allergen, Ovalbumin Egg allergen, Advate, antihemophilic factor, Kogenate, Eloctate, recombinant factor VIII Fc fusion protein, Refacto, Novo VIIa, recombinant factor VII, eptacog alfa, Helixate, Monanine, Coagulation Factor IX, Wilate, Ceredase, Alglucerase, Cerezyme, Imiglucerase, Elelso, taliglucerase alfa, Fabrazyme, Agalsidase beta, Aldurazyme, -I-iduronidase, Myozyme, Acid-glucosidase, Elaprase, iduronate-2-sulfatase, Naglazyme arylsufatase B, or N-acetylgalactosamin e-4-sulfatase, proteinaceous therapies used in enzyme or coagluation factor replacement such as myozyme, alglucerase, imiglucerase, taliglucerase, agalsidase beta, l-iduronidase, acid glucosidase, Iduronate-2-sulfatase, N-acetylgalactosamnie-4-sulfatase, antihemophilic factor, factor VII, eptacogalfa, factor IX, miglustat, romiplastim, epotetin alpha, protein C, laronidase, lumizyme, or Factor VIII.

[0021] In further embodiments, the one or more antigens comprises an autoimmune antigen, an antigen expressed on a tissue to be transplanted into a subject, an enzyme for enzyme replacement therapy, or an allergen. In non-limiting embodiments, the antigen comprises, for example, myelin basic protein, acetylcholine receptor, endogenous antigen, myelin oligodendrocyte glycoprotein, pancreatic beta-cell antigen, insulin, glutamic acid decarboxylase (GAD), collagen type 11, human cartilage gp39, fp130-RAPS, proteolipid protein, fibrillarin, small nucleolar protein, thyroid stimulating factor receptor, histones, glycoprotein gp70, pyruvate dehydrogenase dehydrolipoamide acetyltransferase (PCD-E2), hair follicle antigen, aqua porin 4, Desmoglein 1, Desmoglein 3, nicotinic acetylcholine receptor, A-gliaden, and human tropomyosin isoform 5, Bahia grass pollen (BaGP), peach allergen Pru p 3, alpha s 1-Caein Milk allergen, Apig1 celery allergen, Bere1 Brazil nut allergen, B-Lactoglobulin Milk allergen, Bovine serum albumin, Cor a 1.04 Hazelnut allergen, insulin, proinsulin, islet-specific glucose-6-phophatase catalytic subunit-related protein (IGRP), Ovalbumin Egg allergen, proteinaceous therapies used in enzyme or coagluation factor replacement such as myozyme, alglucerase, imiglucerase, taliglucerase, agalsidase beta, l-iduronidase, acid glucosidase, Iduronate-2-sulfatase, N-

acetylgalactosamnie-4-sulfatase, antihemophilic factor, factor VII, eptacogalfa, factor IX, miglustat, romiplastim, epotetin alpha, protein C, laronidase, lumizyme, or Factor VIII.

[0022] In further embodiments, the particles are covalently coupled to one or more antigens comprising one or more epitopes. In a further embodiment, the epitope is associated with an allergy, an autoimmune disease, an enzyme used in enzyme replacement therapy, lysosomal storage disease, or an inflammatory disease or disorder. In one embodiment, the epitope is associated with type 1 diabetes, multiple sclerosis, Systemic Lupus, Neuromyelitis Optica, Idiopathic Thrombocytopenic Purpura, Thrombotic Thrombocytopenic Purpura, Membranous Nephropathy, Bullous Phemphigoid, Phemphigus Vulgaris, Myasthenia Gravis, a mucopolysaccharide storage disorder, gangliosidosis, alkaline hypophosphatasia, cholesterol ester storage disease, hyperuricemia, growth hormone deficiency, renal anemia, Gaucher's disease, Fabry's disease, Hurler's disease, Hunter's disease, Maroteaux-Lamy disease, hemophilia A, hemophilia B, von Wilebrand disease, venous thrombosis, purpura fulminans, mucopolysaccaridosis VI, pompe disease, Celiac's disease, or inflammatory bowel disease, including Crohn's disease or colitis, *e.g.* ulcerative colitis. In a further embodiment the epitopes are found within proteinaceous therapies used in enzyme or coagulation factor replacement such as myozyme, alglucerase, imiglucerase, taliglucerase, agalsidase beta, l-iduronidase, acid glucosidase, Iduronate-2-sulfatase, N-acetylgalactosamnie-4-sulfatase, antihemophilic factor, factor VII, eptacogalfa, factor IX, miglustat, romiplastim, epotetin alpha, protein C, laronidase, lumizyme Factor VIII. In a further embodiment, the epitope is an epitope described in Tables 2 or 3. In one embodiment, the particles are coupled to antigens comprising only one epitope associated with one disease and/or disorder. In a further embodiment, antigens comprise more than one epitope associated with the same disease and/or disorder. In a further embodiment, the antigens comprise more than one epitope associated with different diseases and/or disorders.

[0023] In some embodiments, the one or more antigens is covalently coupled to said particle by a conjugate molecule. In some embodiments, the one or more antigens is directly covalently bound to said carrier particle. In some embodiments, the one or more antigens is covalently coupled to said particle by a linker. In some embodiments, the conjugate molecule comprises a carbodiimide compound. In some embodiments, the conjugate molecule comprises 1-Ethyl-3-(3-dimethylaminopropyl)carbodiimide (EDC). In some embodiments, the linkers can include, but are not limited to, a variety of bifunctional protein coupling agents such as N-succinimidyl-3-(2-pyridyldithio)propionate (SPDP), succinimidyl-4-(N-maleimidomethyl)cyclohexane-1-carboxylate, iminothiolane (IT), bifunctional derivatives of

imidoesters (such as dimethyl adipimidate HCL), active esters (such as disuccinimidyl suberate), aldehydes (such as glutareldehyde, paraformaldehyde), bis-azido compounds (such as bis (p-azidobenzoyl)hexanediamine), bis-diazonium derivatives (such as bis-(p-diazoniumbenzoyl)-ethylenediamine), diisocyanates (such as toluene 2,6-diisocyanate), and bis-active fluorine compounds (such as 1,5-difluoro-2,4-dinitrobenzene), Biotinylation and streptavidin complexing. Particular coupling agents include N-succinimidyl-3-(2-pyridyldithio)propionate (SPDP) and N-succinimidyl-4-(2-pyridylthio)pentanoate (SPP) to provide for a disulfide linkage.

[0024] In some embodiments, the one or more antigens is encapsulated in the particle which has a negative surface zeta potential. In some embodiments, the particle is biodegradable.

[0025] In some embodiments, the present invention provides methods of inducing antigen-specific tolerance in a subject comprising: administering to said subject an effective amount of a composition comprising one or more antigens covalently coupled to a carrier particle having a negative zeta potential, wherein said one or more antigens is encapsulated in said particle, and wherein said particle and antigen induce tolerance of said antigen in said subject.

[0026] In some embodiments, the present invention provides a method of inducing antigen-specific tolerance in a subject comprising: administering to said subject an effective amount of a composition comprising one or more antigens covalently attached to a carrier particle having a negative zeta potential, wherein said one or more antigens is encapsulated in said particle.

[0027] In some embodiments, administering is performed to treat or prevent a disease or condition. In some embodiments, administering is performed prior or subsequent to onset of a disease or condition that is caused by said antigen. In some embodiments, the disease or condition is selected from the group consisting of: an autoimmune disease, inflammatory disease, an allergy, transplantation rejection, a lysosomal storage disease, an enzyme deficiency, inflammatory response and a hyperimmune response. In some embodiments, the disease or condition is selected from the group consisting of: multiple sclerosis, type 1 diabetes, asthma, a food allergy, an environmental allergy, Celiac disease, inflammatory bowel disease, including Crohn's disease or ulcerative colitis, a mucopolysaccharide storage disorder, gangliosidosis, alkaline hypophosphatasia, cholesterol ester storage disease, hyperuricemia, growth hormone deficiency, renal anemia Hemophilia, Hemophilia A, Hemophilia B, von Willebrand disease, Gaucher's Disease, Fabry's Disease, Hurler's Disease, Pompe's Disease, Hunter's Disease, Maroteaux-Lary Disease and a condition caused by said antigen in said subject to reduce overreaction to said antigen. In some

embodiments, said composition minimizes or eliminates burst release of said antigen in said subject after administration. In some embodiments, methods further comprise repeating said administration of said composition into said subject.

[0028] In a further embodiment, the administration of the particles results in activation induced death of effector T cells.

[0029] In a further embodiment, the administration of the particles results in anergy of effector T cells.

[0030] In a further embodiment, the administration of particles results in apoptosis of effector T cells.

[0031] In a further embodiment, the administration of particles results in the conversion of effector T cells to regulatory T cells.

[0032] In a further embodiment, the administration of particles results in the conversion of effector T cells to FOXP3 expressing regulatory T cells.

[0033] In a further embodiment, the administration of particles results in the conversion of effector T cells to regulatory T cells devoid of FOXP3 expression.

[0034] In a further embodiment, the administration of particles results in the induction and expansion of both antigen specific and non-specific regulatory T cells. In a further embodiment, the administration of particles results in the isolation of effector T cells in the lymph nodes and spleen inhibiting their ability to traffic to peripheral sites and cause inflammation.

[0035] In a further embodiment, the administration of particles results in the down regulation of T cell dependent antibody production.

[0036] In certain embodiments, the present invention provides methods for treating celiac disease in a subject comprising administering to said subject an effective amount of a composition comprising an antigen covalently coupled to a carrier particle having a negative zeta potential. In certain embodiments, the antigen is gliaden or a gliaden epitope. In some embodiments, the antigen is one or more antigens selected from the group consisting of SEQ ID NOs: 1295-1724, SEQ ID NOs: 1726-1766 and SEQ ID NOs: 4986-5140. In some embodiments, the antigen is gliaden and the antigen-coupled particle has a post-synthesis average size of about 600-1500 nanometers and a post-synthesis average charge of about -30 to about -80 mV. In some embodiments, the particle has a post-synthesis average size of about 600-1200 nanometers and a post-synthesis average charge of about -40 to about -70 mV. In certain embodiments, the particle has a post-synthesis average size of about 600 microns and a post-synthesis average charge of about -50 mV. In further embodiments, the

particle is a polystyrene particle, a carboxylated polystyrene particle, a PLURONIC® stabilized polypropylene sulfide particle, or a poly(lactic-co-glycolic acid) particle.

[0037] In some embodiments, the present invention provides methods of treating diabetes in a subject comprising administering to said subject an effective amount of a composition comprising an antigen covalently coupled to a carrier particle having a negative zeta potential, wherein said antigen is encapsulated in said particle. In some embodiments, the diabetes is type I diabetes. In some embodiments, the diabetes is type II diabetes.

[0038] In some embodiments, the antigen is insulin, proinsulin, islet-specific glucose-6-phophatase catalytic subunit-related protein (IGRP) or epitopes derived from insulin proinsulin, or IGRP. In some embodiments, the antigen is one or more antigen selected from the group consisting of ID NOs: 1767-1840, SEQ ID NOs: 1842-1962, SEQ ID NOs: 1964-2027, SEQ ID NOs: 2029-2073, SEQ ID NOs: 2075-2113, SEQ ID NOs: 2115-2197, SEQ ID NOs: 2199-2248, SEQ ID NOs: 2250-2259, SEQ ID NOs: 2261-2420, SEQ ID NOs: 2422-2486, and SEQ ID NOs: 2489-2505. In some embodiments, the antigen is insulin and the antigen-coupled particle has a post-synthesis average size of about 300-800 nanometers and a post-synthesis average charge of about -30-to about -70 mV. In some embodiments, the particle has a post-synthesis average size of about 350-600 nanometers and a post-synthesis average charge of about -40 to about -60 mV. In some embodiments, the particle has a post-synthesis average size of about 500 nanometers and a post-synthesis average charge of about -50 mV. In some embodiments, the antigen is pro-insulin and the antigen-coupled particle has a post-synthesis average size of about 300-800 nanometers and a post-synthesis average charge of about -30 to about -70 mV. In certain embodiments, the particle has a post-synthesis average size of about 400-600 nanometers and a post-synthesis average charge of about -40 to about -60 mV. In some embodiments, the particle has a post-synthesis average size of about 570 nanometers and a post-synthesis average charge of about -45 mV. In some embodiments, the antigen is IGRP and the antigen-coupled particle has a post-synthesis average size of about 300-800 nanometers and a post-synthesis average charge of about -30 to about -70 mV. In some embodiments, the particle has a post-synthesis average size of about 400-700 nanometers and a post-synthesis average charge of about -40 to about -60 mV. In some embodiments, the particle has a post-synthesis average size of about 600 nanometers and a post-synthesis average charge of about -40 mV. In certain embodiments, the particle is a polystyrene particle, a carboxylated polystyrene particle, a PLURONIC® stabilized polypropylene sulfide particle, or a poly(lactic-co-glycolic acid) particle.

[0039] In some embodiments, the present invention provides methods of treating a subject undergoing enzyme replacement therapy, comprising administering to said subject an effective amount of a composition comprising one or more antigens covalently coupled to a carrier particle having a negative zeta potential, wherein said one or more antigens is encapsulated in said particle. In some embodiments, the subject is undergoing enzyme replacement therapy for treatment of a disease selected from the group consisting of Hemophilia, Hemophilia A, Hemophilia B, von Willebrand disease, a mucopolysaccharide storage disorder, gangliosidosis, alkaline hypophosphatasia, cholesterol ester storage disease, hyperuricemia, growth hormone deficiency, renal anemia Gaucher's Disease, Fabry's Disease, Hurler's Disease, Pompe's Disease, Hunter's Disease, and Maroteaux-Lary Disease. In some embodiments the antigen coupled particle comprises one or more enzyme selected from the group consisting of Advate, antihemophilic factor, Kogenate, Eloctate, recombinant factor VIII Fc fusion protein, Refacto, Novo VIIa, recombinant factor VII, eptacog alfa, Helixate, Monanine, Coagulation Factor IX, Wilate, Ceredase, Alglucerase, Cerezyme, Imiglucerase, Elelso, taliglucerase alfa, Fabrazyme, Agalsidase beta, Aldurazyme, -I-iduronidase, Myozyme, Acid-glucosidase, Elaprase, iduronate-2-sulfatase, Naglazyme arylsufatase B, and N-acetylgalactosamin e-4-sulfatase. In some embodiments, the particle is a polystyrene particle, a carboxylated polystyrene particle, a PLURONIC stabilized polypropylene sulfide particle, or a poly(lactic-co-glycolic acid) particle. In certain embodiments, the particle is a co-polymer having a molar ratio from about 80:20 to about 100:0. In certain embodiments, the particle is a polystyrene particle, a carboxylated polystyrene particle, a PLURONIC stabilized polypropylene sulfide particle, or a poly(lactic-co-glycolic acid) particle. In other embodiments, the particle is a poly(lactic-co-glycolic acid) particle and has a copolymer ratio of about 50:50 polylactic acid:polyglycolic acid.

[0040] In a further embodiment, the administration of the particles of the invention prevents the accumulation of neutrophils and other granulocytes in a subject. In a further embodiment, the particles of the invention are administered to a subject who has cancer.

[0041] In one embodiment, administration of the particles of the invention increases regeneration of damaged tissue. In a further embodiment, the particles increase regeneration of epithelial cells. In yet a further embodiment, the particles increase remyelination of neurons. In another embodiment, the subject has an autoimmune disease. In yet another embodiment, the subject has inflammatory bowel disease, including ulcerative colitis, and/or Crohn's disease. In yet another embodiment, the subject has multiple sclerosis.

[0042] In one embodiment, administration of the particles of the invention to a subject minimizes or eliminates burst release of said antigen in said subject after administration.

[0043] In some embodiments the composition is administered intravenously. In some embodiments, the composition is administered subcutaneously, orally, intramuscularly, intra-lymphatically, portally or via aerosol. In one embodiment, administration of the negatively charged particles induces antigen-specific tolerance in a subject. In one embodiment, the particles that induce antigen-specific tolerance comprise one or more epitopes associated with an allergy, autoimmune disease, and/or inflammatory disease. In one embodiment, the epitopes are selected from those described in Tables 2 or 3. In one embodiment, the negatively charged particles are polystyrene, diamond, PLURONIC® stabilized polypropylene sulfide, or poly(lactic-co-glycolic acid) particles. In one embodiment the particles are carboxylated. In one embodiment, the particles have a zeta potential of less than about -100 mV. In some embodiments, the particles have a zeta potential between about -100 mV and about -15 mV. In some embodiments, the particles have a zeta potential between about -100 mV and about -75 mV. In some embodiments, the particles have a zeta potential between about -50 mV and about -20 mV. In one embodiment, the particle has an average diameter of about 0.1 μm to about 10 μm, for example from about 0.2μm to about 2μm or about 0.3 μm to about 5 μm, or 0.5 μm to about 3 μm or about 0.5 μm to about 1 μm.

[0044] In one embodiment, the subject has an autoimmune disease. In one embodiment, the autoimmune disease is multiple sclerosis, scleroderma, type-I diabetes, rheumatoid arthritis, thyroiditis, systemic lupus erythmatosis, Reynaud's syndrome, Sjorgen's syndrome, autoimmune uveitis, autoimmune myocarditis, inflammatory bowel disease, Amyotrophic Lateral Sclerosis (ALS), Systemic Lupus, Neuromyelitis Optica, Idiopathic Thrombocytopenic Purpura, Thrombotic Thrombocytopenic Purpura, Membranous Nephropathy, Bullous Phemphigoid, Phemphigus Vulgaris, Myasthenia Gravis, Celiac disease, ulcerative colitis, or Crohn's disease. In one embodiment, the particle comprises a full-length polypeptide or fragment thereof. In one embodiment, the particle comprises one or more myelin basic protein epitopes. In one embodiment, the myelin basic protein epitope is from SEQ ID NO: 4975 or SEQ ID NO: 4976. In one embodiment, the particles comprise one or more myelin oligodendrocyte glycoprotein epitopes. In one embodiment, the myelin oligodendrocyte glycoprotein epitope is from SEQ ID NO: 1 or SEQ ID NO: 4978. In one embodiment, the particle contains one or more insulin epitopes. In one embodiment, the one or more insulin epitopes is from SEQ ID NO: 4981. In one embodiment, the particle comprises one or more glutamic acid decarboxylase epitopes. In one embodiment, the

glutamic acid decarboxylase epitopes is from SEQ ID NO: 4982. In one embodiment, the particle contains one or more proteolipid protein epitopes. In one embodiment, the proteolipid protein epitope is from SEQ ID NO: 4977. In one embodiment, the particle comprises one or more gliaden epitopes. In one embodiment, the gliaden epitopes comprise SEQ ID NOs: 4983-4985.

[0045] In one embodiment, the present invention provides for a method of inducing regulatory T cells comprising treating said T cells with an effective amount of a composition comprising one or more antigens covalently coupled to a carrier particle having a negative zeta potential, wherein said one or more antigens is encapsulated in said particle, and wherein the particle size is greater than 80 nm.

[0046] In some embodiments, the present invention further provides a process for the preparation of a tolerizing immune modified particle (TIMP) having a negative zeta potential, said process comprising: a) covalently linking one or more carrier polymers with one or more antigens to form carrier polymer-antigen conjugates; and b) combining carrier polymer-antigen conjugates with unconjugated carrier polymer at predetermined mixing ratios in a solution under conditions effective to form the TIMP, wherein a TIMP having a negative zeta potential is formed, and wherein the one or more antigens is encapsulated in the TIMP.

[0047] In some embodiments, the present invention further provides a process for the preparation of a tolerizing immune modified particle (TIMP) having a negative zeta potential, said process comprising: a) covalently linking one or more carrier polymers with one or more antigens to form carrier polymer-antigen conjugates; and b) contacting the carrier polymer-antigen conjugates with a solution under conditions effective to form the TIMP, wherein the TIMP having a negative zeta potential is formed, and wherein the one or more antigens is encapsulated in the TIMP. In some embodiments, the contacting the carrier polymer-antigen conjugates with a solution occurs in the presence of an unconjugated carrier polymer at predetermined mixing ratios.

[0048] In some embodiments, the particle created by the process has a zeta potential of less than about -100 mV. In some embodiments, the particle has a zeta potential between about -100 mV and about -15 mV. In some embodiments, the particle has a zeta potential between about -100 mV and about -75 mV. In some embodiments, the particle has a zeta potential between about -50 mV and about -20 mV.

[0049] In some embodiments, the particle created by the process has an average diameter of about 0.1 μm to about 10 μm, for example from about 0.2μm to about 2μm or about 0.3 μm to about 5 μm, or 0.5 μm to about 3 μm or about 0.5 μm to about 1 μm.

[0050] In some embodiments, the particle created by the process comprises a polystyrene particle, a carboxylated polystyrene particle, PLURONIC® stabilized polypropylene sulfide particle, or a poly(lactic-co-glycolic acid) particle. In some embodiments, the particle comprises a poly(lactic-co-glycolic acid) particle.

[0051] In some embodiments, the one or more antigens of the process is covalently coupled to said one or more carrier polymers by a conjugate molecule. In some embodiments, the one or more antigens is covalently coupled to said one or more carrier polymers by a linker. In some embodiments, the conjugate molecule comprises a carbodiimide compound. In some embodiments, the conjugate molecule comprises 1-Ethyl-3-(3-dimethylaminopropyl)carbodiimide (EDC).

[0052] In some embodiments, the one or more carrier polymers is formed by co-polymerization. In some embodiments, the solution is a buffer solution. In some embodiments, the solution has a basic pH. In some embodiments, the solution comprises sodium bicarbonate, potassium bicarbonate, lithium bicarbonate, potassium dihydrogen phosphate, sodium dihydrogen phosphate, or lithium dihydrogen phosphate.

[0053] In some embodiments, the TIMPs does not contain other bioactive agents (i.e. drugs, immunomodulators, cytokines). In some embodiments, the TIMP is biodegradable. In some embodiments, the process further comprises formulating said TIMP in a pharmaceutically acceptable carrier.

BRIEF DESCRIPTION OF THE DRAWINGS

[0054] FIG. 1 shows the synthesis of PLG-fluorescent dye and PLG-antigen conjugates using EDC/NHS as the coupling reagent.

[0055] FIG. 2 shows the synthesis and characterization of PLG-peptide conjugates and nanoparticle formation. ^{1}H-NMR spectrum of (i) PLG, (ii) $OVA_{323-339}$, and (iii) PLG-$OVA_{323-339}$ measured in DMSO-d6 (calibrated at 2.5 ppm)(FIG. 2A). The coupling efficiency of $OVA_{323-339}$, $PLP_{139-151}$ and $PLP_{178-191}$ to PLG was calculated by comparing the integration values of the overlapping methyl proton peaks of leucine and isoleucine present at 1.4 ppm in $OVA_{323-339}$ (d, d') to the methylene proton peak present at 5.3 ppm in PLG (b). (FIG. 2B). A schematic representation of polymer-conjugate nanoparticles is provided in FIG. 2C.

[0056] FIG. 3 shows size and time-dependent cellular interactions of PLG nanoparticles. 80 nm and 400 nm PLG nanoparticles were fluorescently labeled with 1% (by wt.) PLG-Cy5.5 conjugate and incubated with bone marrow-derived dendritic cells (BMDCs) or bone

marrow-derived macrophages (BMMOs) up to 4 hr at 37°C. Blue: DAPI; Red: PLG-Cy5.5 nanoparticles).

[0057] FIG. 4A-4F shows BMDC surface marker characterization after treatment with PLG-$OVA_{323-339}$ particles having various antigen loadings. (FIG. 4A and FIG. 4D) MHCII marker expression following treatment with 400 nm and 80 nm particles, respectively, (FIG. 4B and FIG. 4E) CD80 marker expression following treatment with 400 nm and 80 nm particles, respectively, (FIG. 4C and FIG. 4F) CD86 marker expression following treatment with 400 nm and 80 nm particles, respectively.

[0058] FIG. 5 shows antigen-specific induction of regulatory T cells by PLG-$OVA_{323-339}$ particles delivered to antigen presenting cells (APCs). The difference in induction in BMDC versus BMMO cells was significant, at $p < 0.0001$.

[0059] FIG. 6 shows size- and antigen-loading-dependent CD25 activation and induction of regulatory T cells by PLG-$OVA_{323-339}$ particles. * indicates significance at $p < 0.05$.

[0060] FIG. 7A-7B shows induction of regulatory T cells indicated by (FIG. 7A) CD25 activation and by (FIG. 7B) foxp3 expression as a function of PLG-$OVA_{323-339}$ particle dose.

[0061] FIG. 8A-8E shows size- and concentration-dependent biodistribution of PLG particles. FIG. 8A, mice were injected either intravenously (IV) or subcutaneously (SC) with 1.25 mg of 400 nm or 80 nm PLG-Cy5.5 nanoparticle formulation. Cells from the liver, kidney, heart, lung, spleen and inguinal lymph nodes were isolated. Data was analyzed by flow cytometry 24 hr after injection. FIG. 8B, the proportion of cells that were CD45+ versus CD45- was determined for liver, spleen and lung. FIG. 8C, mice were injected IV with 1.25 mg of PLG-Cy5.5 nanoparticle formulations of various particle sizes. Data was analyzed by flow cytometry 24 hr after injection. The proportion of Cy5.5+ cells found in the liver, spleen and lung was determined for a given particle size. FIG. 8D, the percentage of either CD45+ or CD45- cells that were Cy5.5+ was determined for a given particle size. FIG. 8E, the percentage of either CD45+ or CD45- cells that were Cy5.5+ was determined for the 400 nm PLG-Cy5.5 particle size.

[0062] FIG. 9 shows flow cytometric analysis of blood of healthy mice (n=3) injected intravenously with 1.25 mg of 400 nm or 80 nm PLG-Cy5.5 nanoparticle formulation. Blood was collected and analyzed 2 hr after injection. Expression of CD11b, CD11c, Gr-1 and Ly6c markers were used to identify the types of leukocytes. Cy5.5 fluorescence was used to determine which cells had PLG-Cy5.5 nanoparticles.

[0063] FIG. 10 shows that PLG particles induce regulatory T cells *ex vivo* and induce tolerance in experimental autoimmune encephalitis (EAE). BMDCs, splenic dendritic cells or

liver dendritic cells were treated for 12-24 hr with 0.1ug/mL of either OVA alone or 0.1ug/mL PLG-OVA nanoparticle formulations (0.01-10μg/mg PLG antigen loading). Flow cytometry was used to measure CD25 activation and foxp3 expression of T cells as indication of induction of regulatory T cells (FIG. 10A). Mice were injected intravenously with 1.25 mg of PLG-Cy5.5 nanoparticle formulations. Flow cytometry was used to measure CD25 activation and foxp3 expression of T cells as indication of induction of regulatory T cells 24 hr after injection (FIG. 10B). The peptides administered to the animals were covalently coupled to particles with a diameter of 200-1200 nm. Mice were treated with either $PLP_{139-151}$-PLG (N=5) or PBS buffer on day -7 relative to the time of immunization (day 0). Peak disease was typically observed around day 12 to 14, and mice were scored for clinical disease. PBS buffer only did not prevent disease induction. However, PLG particles covalently coupled with $PLP_{139-151}$ or derived from PLGA covalently linked with antigen produced a clinical score of 0 (no disease) at all except low clinical scores of under 1 exhibited between days 20 and 30 (FIG. 10C). Treatment of mice with nanoparticle formulation resulted in significant abrogated clinical disease scores as measured by cumulative disease scores on days 0-30 post immunization (FIG. 10D). * indicates significance at $p < 0.05$.

[0064] FIG. 11 shows synthesis and characterization of PLG-peptide conjugates and nanoparticle formation. (FIG. 11A) ^{1}H-NMR spectrum of (i) PLG, (ii) $OVA_{323-339}$, and (iii) PLG-$OVA_{323-339}$ measured in DMSO-d6 (calibrated at 2.5 ppm). (FIG. 11B) The coupling efficiency of $OVA_{323-339}$ to PLG was calculated by comparing the integration values of the overlapping methyl proton peaks of leucine and isoleucine present at 1.4 ppm in OVA (d, d') to the methylene proton peak present at 5.3 ppm in PLG (b). (FIG. 11C) Schematic representation of antigen-conjugate nanoparticles. (FIG. 11D) PLG, PLG(OVA), PLG-OVA, and acPLG-OVA were incubated with FITC-labeled anti-$OVA_{323-339}$ IgG to identify the presence of peptide on the surface of the particles. Results are geometric mean fluorescence intensity. (FIG. 11E) Release profile of PLG($OVA_{323-339}$) and acPLG-$OVA_{323-339}$. $p<0.05$.

[0065] FIG. 12 shows that regulatory T cell induction in vitro is dependent on nanoparticle size and Ag loading. Bone marrow-derived dendritic cells were treated for 3 h with 300 μg/mL of 400 nm (FIG. 12B and FIG. 12D) and 80 nm (FIG. 12C and FIG. 12E) acPLG-$OVA_{323-339}$ particles. Excess acPLG-$OVA_{323-339}$ particles were subsequently washed from the wells prior to addition of naïve $CD4^+$ OT-II T cells and 2 ng/mL of TGF-β. Cells were co-cultured for 4 days prior to flow cytometric analysis. (FIG. 12A) Representative gating strategy for regulatory T cell induction. Single, live, CD4+ cells were examined for CD25

and Foxp3 expression. (FIG. 12B and FIG. 12C) The effect of antigen loading on CD25 and (FIG. 12D and FIG. 12E) Foxp3 expression of T cells was measured. Although both particles formulations were able to increase CD25 expression similarly, only 400 nm acPLG-$OVA_{323-339}$ particles could efficiently induce $CD4^+CD25^+Foxp3^+$ regulatory T cells.

[0066] FIG. 13 shows that regulatory T cell induction is dependent on nanoparticle concentration. Bone marrow-derived dendritic cells were treated for 3 hr with various concentrations of 400 nm of PLG-OVA nanoparticles (8 μg/mg loading) formulation. Excess acPLG-$OVA_{323-339}$ particles were subsequently washed from the cell surface prior to addition of OT-II T cells and 2 ng/mL of TGF-β1. The cells were co-cultured for 4 days prior to using flow cytometry to measure CD25 activation (FIG. 13A) and Foxp3 expression (FIG. 13B) of T cells.

[0067] FIG. 14 shows that acPLG(Ag) nanoparticles prophylactically induce tolerance in R-EAE. Clinical scores for SJL/J mice treated with PBS (control), 2.5 mg of PLG($PLP_{139-151}$) (1.4 μg/mg PLP) or 1.25 mg of acPLG-$PLP_{139-151}$ (8 μg/mg $PLP_{139-151}$) and immunized with $PLP_{139-151}$/CFA to induce R-EAE 7 days later. (FIG. 14A) Treatment of mice with nanoparticle formulations resulted in significantly abrogated clinical disease scores compared to PBS. (FIG. 14B) Corresponding cumulative clinical score for mice treated with tolerogenic particles. (n = 3-7).

[0068] FIG. 15 shows that acPLG(Ag) particles induce protective tolerance against R-EAE induced with cocktail of autoantigens. Clinical scores of SJL/J mice treated with 1.25 mg of pcPLG-$OVA_{323-339}$ (8 μg/mg $OVA_{323-339}$), pcPLG-$PLP_{139-151}$ (8 μg/mg $PLP_{139-151}$), pcPLG-$PLP_{178-191}$ (8 μg/mg $PLP_{178-191}$), or pcPLG-$PLP_{139-151,178-191}$ (8 μg/mg $PLP_{139-151}$ and 8 μg/mg $PLP_{178-191}$) and immunized with $PLP_{139-151}$ and $PLP_{178-191}$ in CFA to induce R-EAE 7 days later. (FIG. 15A) Schematic representation of antigen-polymer conjugate nanoparticles delivering multiple Ags. (FIG. 15B) Treatment of mice with acPLG nanoparticle formulated with both pathogenic epitopes resulted in significantly abrogated mean clinical disease scores compared to mice treated with only a single or irrelevant epitope. (FIG. 15C) Corresponding cumulative clinical score for mice treated with particles. (n = 3-7).

[0069] FIG. 16 shows BCA assay raw data for determination of protein content per mg of PLGA-OVA conjugate.

[0070] FIG. 17 shows CD25+Foxp3+ cell percentage of CD4+ T cells.

[0071] FIG. 18 shows CD25+Foxp3+ cell percentage of CD4+ T cells.

[0072] FIG. 19 shows synthesis and characterization of PLGA-$PLP_{139-151}$ conjugates. ^1H-NMR spectrum of (i) PLGA, (ii) $PLP_{139-151}$, and (iii) PLGA-$PLP_{139-151}$ measured in DMSO-d6 (calibrated at 2.5 ppm).

[0073] FIG. 20 shows synthesis and characterization of PLGA-$PLP_{178-191}$ conjugates. ^1H-NMR spectrum of (i) PLGA, (ii) $PLP_{178-191}$, and (iii) PLGA-$PLP_{178-191}$ measured in DMSO-d6 (calibrated at 2.5 ppm).

DETAILED DESCRIPTION OF THE INVENTION

[0074] The present inventors have found that tolerizing immune modified particles (TIMPs) in which encapsulated antigens are covalently linked to the internal surface of the particles allow for exquisite control of particle size and antigen encapsulation and reduction of antigen burst effects while still avoiding the unwanted side effects associated with surface coupled peptides. The process for producing such TIMPs comprises covalently coupling one or more antigens to one or more carrier polymers to form carrier polymer-antigen conjugates, followed by combining carrier polymer-antigen conjugates with unconjugated carrier polymer at predetermined mixing ratios in a solution under conditions effective to form TIMPs, with one or more antigens encapsulated therein. These TIMPs can induce tolerance to autoimmune disease and decrease the immune response. These particles, therefore, may be useful in the treatment of any disease or condition characterized by an excessive inflammatory immune response, such as autoimmune diseases or allergies. These TIMPs can minimize or eliminate burst release of one or more antigens from the particle. Minimizing or eliminating burst release of an antigen may be desirable, for example, to better control the amount of antigen released during treatment, to avoid toxic levels of the antigen, and/or to avoid ineffective antigen delivery.

[0075] As used herein and in the appended claims, the singular forms "a," "an," and "the" include plural reference unless the context clearly indicates otherwise.

[0076] It is understood that aspects and embodiments of the invention described herein include "comprising," "consisting," and "consisting essentially of" aspects and embodiments.

[0077] In some embodiments, reference to "about" a value or parameter herein includes (and describes) variations that are directed to that value or parameter per se. For example, description referring to "about X" includes description of "X".

[0078] "Particle" as used herein refers to any non-tissue derived composition of matter. It may be a sphere or sphere-like entity, bead, or liposome. The term "particle", the term "immune modifying particle", the term "carrier particle", and the term "bead" may be used

interchangeably depending on the context. Additionally, the term "particle" may be used to encompass beads and spheres.

[0079] "Negatively charged particle" as used herein refers to particles which have been modified to possess a net surface charge that is less than zero.

[0080] "Carboxylated particles" or "carboxylated beads" or "carboxylated spheres" includes any particle that has been modified to contain a carboxyl group on its surface. In some embodiments the addition of the carboxyl group enhances phagocyte/monocyte uptake of the particles from circulation, for instance through the interaction with scavenger receptors such as MARCO. Carboxylation of the particles can be achieved using any compound which adds carboxyl groups, including, but not limited to, poly(ethylene-maleic anhydride) (PEMA).

[0081] "Carrier particle" as used herein refers to a particle that is covalently coupled to an antigen before forming a tolerizing immune modified particle (TIMP). Also, "carrier particle" or "carrier polymer" as used herein refers to a polymer that can be covalently attached to an antigen to form a tolerizing immune modified particle (TIMP). The particle may be a polymer which can be, but is not limited to, polystyrene, carboxylated polystyrene, diamond, PLURONIC® stabilized polypropylene sulfide or poly(lactic-co-glycolic acid).

[0082] "Unconjugated carrier polymer" or "unconjugated carrier particle" refers to a carrier polymer or carrier particle that does not comprise an antigen covalently bound thereto.

[0083] "Loading" as used herein refers to the amount of antigen per amount of carrier polymer. Loading can be expressed as micrograms (μg) of antigen per milligram (mg) of carrier polymer.

[0084] "Antigenic moiety" as used herein refers to any moiety, for example, a peptide that is recognized by the host's immune system. Examples of antigenic moieties include, but are not limited to, autoantigens, enzymes, and/or bacterial or viral proteins, peptides, drugs or components. Without being bound by theory, while the carboxylated beads themselves may be recognized by the immune system, the carboxylated beads with nothing more attached thereto are not considered an "antigenic moiety" for the purposes of the invention.

[0085] "Naked beads" or "naked particles" or "naked spheres" as used herein refers to beads, particles or spheres that have not been carboxylated.

[0086] "Pro-inflammatory mediators" or "pro-inflammatory polypeptides" as used herein refers to polypeptides or fragments thereof which induce, maintain, or prolong inflammation in a subject. Examples of pro-inflammatory mediators include, but are not limited to, cytokines and chemokines.

[0087] As used herein, the term "Inflammatory monocyte" refers to any myeloid cell expressing any combination of CD14/CD26 and CCR2.

[0088] As used herein, the term "inhibitory neutrophil" refers to neutrophils, and/or monocyte derived suppressor cells.

[0089] As used herein, the term "Th cell" or "helper T cell" refers to $CD4^+$ cells. $CD4^+$ T cells assist other white blood cells with immunologic processes, including maturation of B cells into plasma cells and memory B cells, and activation of cytotoxic T cells and macrophages. T cells become activated when they are presented with peptide antigens by MHC class II molecules, which are expressed on the surface of antigen-presenting cells (APCs).

[0090] As used herein, the term "Th1 cell" refers to a subset of Th cells which produce proinflammatory mediators. Th1 cells secrete cytokines to facilitate immune response and play a role in host defense against pathogens in part by mediating the recruitment of neutrophils and macrophages to infected tissues. Th1 cells secrete cytokines including IFN-gamma, IL2, IL-10, and TNF alpha/beta to coordinate defense against intracellular pathogens such as viruses and some bacteria.

[0091] As used herein, the term "Th2 cell" refers to a subset of Th cells that mediate the activation and maintenance of the antibody-mediated immune response against extracellular parasites, bacteria, allergens, and toxins. Th2 cells mediate these functions by producing various cytokines such as IL-4, IL-5, IL-6, IL-9, IL-13, and IL-17E (IL-25) that are responsible for antibody production, eosinophil activation, and inhibition of several macrophage functions, thus providing phagocyte-independent protective responses.

[0092] As used herein, the term "Th17 cell" refers to a subset of Th cells. Th17 cells secrete cytokines to facilitate immune response and play a role in host defense against pathogens by mediating the recruitment of neutrophils and macrophages to infected tissues. TH17 cells secrete cytokines such as IL17, IL21, IL22, IL24, IL26 and TNF alpha to coordinate defense against extracellular pathogens including fungi and bacteria.

[0093] "Coupled", "linked" or "crosslinked" as used herein with reference to an antigen refers to an antigen covalently bound or covalently attached to a carrier particle and encapsulated within the particle.

[0094] The term "IMP" as used herein refers to immune-modifying particles which are not coupled to an antigen. The term "TIMP" as used herein refers to tolerizing immune modifying particles which are coupled to an antigen. In certain embodiments, the term "IMP" as used herein refers to immune-modifying particles which do not comprise an

antigen. The term "TIMP" as used herein refers to tolerizing immune modifying particles which comprise an antigen.

[0095] The term "bioactive agents" refers to agents other than those used to construct the particle (i.e. polymers, linkers) and the antigens contained therein. Examples of bioactive agents include drugs, immunomodulators and cytokines.

[0096] The particle may have any particle shape or conformation. However, in some embodiments it is preferred to use particles that are less likely to clump *in vivo*. Examples of particles within these embodiments are those that have a spherical shape.

[0097] One aspect of the invention relates to a composition which comprises an immune modified particle with a negative zeta potential coupled to one or more antigens, wherein the one or more antigens is encapsulated within the particle.

[0098] Yet another aspect of the invention relates to a process for the preparation of a tolerizing immune modified particle (TIMP) with a negative zeta potential, said process comprising: a) covalently linking one or more carrier polymers with one or more antigens to form carrier polymer-antigen conjugates; and b) combining carrier polymer-antigen conjugates with unconjugated carrier polymer at predetermined mixing ratios in a solution under conditions effective to form the TIMP, wherein a TIMP with a negative zeta potential is formed. In some embodiments of this invention, the carrier polymer is formed via co-polymerization. The particle microstructure may depend on the method of co-polymerization.

[0099] In some embodiments, the present disclosure provides a process for the preparation of a tolerizing immune modified particle (TIMP) having a negative zeta potential, said process comprising: a) covalently linking one or more carrier polymers with one or more antigens to form carrier polymer-antigen conjugates; and b) contacting the carrier polymer-antigen conjugates with a solution under conditions effective to form the TIMP, wherein the TIMP having a negative zeta potential is formed, and wherein the one or more antigens is encapsulated in the TIMP. In some embodiments, the contacting the carrier polymer-antigen conjugates with a solution occurs in the presence of an unconjugated carrier polymer at predetermined mixing ratios.

[0100] In some embodiments, an antigenic peptide molecule is coupled to the carrier polymer (e.g. PLG) by a conjugate molecule and/or linker group. In some embodiments, coupling of the antigenic peptide and/or apoptotic signalling molecule to the carrier polymer (e.g., PLG) comprises one or more covalent interactions. In some embodiments, the antigenic peptide is encapsulated within the carrier particle with a negative zeta potential.

[0101] In one embodiment, the solution contacting the carrier polymer-antigen conjugates and unconjugated carrier polymer may have a basic pH. Suitable basic pH for the basic solution include 7.1, 7.5, 8.0, 8.5, 9.5, 10.0 10.5, 11.0, 11.5, 12.0, 12.5, 13.0, and 13.5. The solution may also be made of any suitable base and its conjugate. In some embodiments of the invention, the solution may include, without limitation, sodium bicarbonate, potassium bicarbonate, lithium bicarbonate, potassium dihydrogen phosphate, sodium dihydrogen phosphate, or lithium dihydrogen phosphate and conjugates thereof.

[0102] In one embodiment of the invention, the tolerizing immune modified particles contain co-polymers. These co-polymers may have varying molar ratio. Suitable co-polymer ratio of present tolerizing immune modified particles may be 25:75, 30:70, 35:65, 40:60, 45:55, 50:50, 55:45, 60:40, 65:35, 70:30, 75:25, 80:20, 81:19, 82:18, 83:17, 84:16, 85:15, 86:14, 87:13, 88:12, 89:11, 90:10, 91;:9, 92:8, 93:7, 94:6, 95:5, 96:4, 97:3, 98:2, 99:1, or 100:0. In another embodiment, the co-polymer may be periodical, statistical, linear, branched (including star, brush, or comb co-polymers) co-polymers. In some embodiments, the co-polymers ratio may be, but not limited to, polystyrene: poly(vinyl carboxylate)/80:20, polystyrene: poly(vinyl carboxylate)/90:10, poly(vinyl carboxylate): polystyrene/80:20, poly(vinyl carboxylate): polystyrene/90:10, polylactic acid: polyglycolic acid/50:50, polylactic acid: polyglycolic acid/80:20, or polylactic acid: polyglycolic acid/90:10.

[0103] In one embodiment, the particles of the invention are made by adding a composition comprising the carrier particle to a solution of an unconjugated carrier polymer. In some embodiments, the carrier particle is contacted with a solution in the presence of an unconjugated carrier polymer at predetermined mixing ratios. In some embodiments, the unconjugated carrier polymer is PLG (poly(lactide-co-glycolic acid)).

[0104] In one embodiment, the particles of the invention are made by adding a composition comprising the polymer to a solution of a biocompatible polymer. Examples of biocompatible polymers include Poly(ethylene-maleic anhydride) (PEMA) and citric acid based polymer scaffolds. Further examples of biocompatible polymers include poly(alpha-esters), polyurethanes, poly(ester amide), poly(ortho esters), polyanhydrides, poly(anhydride-co-imide), cross-linked polyanhydrides, poly(propylene fumarate), psuedo poly(amino acid), poly(alkyl cyanoacrylates), polyphosphazenes, polyphosphoester, poly(amino acids), polysaccharides, poly(ethylene glycol). (Nair et al. Progress in Polymer Science, 32 (2007) 762-798, which is incorporated herein by reference) A solution of biocompatible polymer can include same or different polymers and mixed in different ratios to provide different effects.

[0105] In one embodiment, the particles of the invention are made by adding a composition comprising the polymer (e.g. PLGA) to a solution of Poly(ethylene-maleic anhydride) (PEMA). The concentration of PEMA in the solution can be between about 0.1% and about 10%. In one embodiment, the concentration of PEMA in the solution is between about 0.2% and about 5%. In another embodiment, the concentration of PEMA in the solution is between about 0.1% and 4%. In another embodiment, the concentration of PEMA in the solution is between about 0.1% and 2%. In another embodiment, the concentration of PEMA in the solution is between about 0.5% and 1%. In one embodiment, the percentage of PEMA in solution is 0.1%, 0.2%, 0.3%, 0.4%, 0.5%, 0.6% 0.7%, 0.8%, 0.9%, 1%, 1.5%, 2%, 2.5%, 3%, 3.5%, 4%, 4.5%, 5%, 6%, 6.5%, 7%, 7.5%, 8%, 8.5%, 9%, 9.5% or 10%. In one embodiment, the percentage of PEMA in the solution is about 0.5%. In another embodiment, the percentage of PEMA in the solution is about 1.0%. Other compounds that may be used include, but are not limited to, Poly(ethylene-*alt*-maleic anhydride), Poly(isobutylene-*co*-maleic acid), Poly(methyl vinyl ether-*alt*-maleic acid), Poly(methyl vinyl ether-*alt*-maleic acid monoethyl ester), Poly(methyl vinyl ether-*alt*-maleic anhydride), Poly(methyl vinyl ether-*alt*-maleic anhydride) cross-linked with 1,9-decadiene powder, and/or Poly(styrene-*alt*-maleic acid) sodium salt.

[0106] In one embodiment, the particle is a liposome. In a further embodiment, the particle is a liposome composed of the following lipids at the following molar ratios – 30:30:40 phosphatidylcholine:phosphatidylglycerol:cholesterol. In yet a further embodiment, the particle is encapsulated within a liposome.

[0107] It is not necessary that each particle be uniform in size, although the particles must generally be of a size sufficient to be sequestered in the spleen or liver and trigger phagocytosis or uptake through receptor or non-receptor mediated mechanism by an antigen presenting cell, including endothelial cell or other MPS cell. Preferably, the particles are microscopic or nanoscopic in size, in order to enhance solubility, avoid possible complications caused by aggregation *in vivo* and to facilitate pinocytosis. Particle size can be a factor for uptake from the interstitial space into areas of lymphocyte maturation. A particle having a diameter of from about 0.1μm to about 10 μm is capable of triggering phagocytosis. Thus in one embodiment, the particle has a diameter within these limits. In another embodiment, the particle has an average diameter of about 0.3 μm to about 5 μm. In still another embodiment, the particle has an average diameter of about 0.5 μm to about 3 μm. In another embodiment, the particle has an average diameter of about 0.2μm to about 2μm. In a further embodiment the particle has an average size of about 0.1 μm, or about 0.2 μm or

about 0.3 μm or about 0.4 μm or about 0.5 μm or about 1.0 μm or about 1.5 μm or about 2.0 μm or about 2.5 μm or about 3.0 μm or about 3.5 μm or about 4.0 μm or about 4.5 μm or about 5.0 μm. In a particular embodiment the particle has an average size of about 0.5 μm. In some embodiments, the overall weights of the particles are less than about 10,000 kDa, less than about 5,000 kDa, or less than about 1,000 kDa, 500 kDa, 400 kDa, 300 kDa, 200 kDa, 100 kDa, 50 kDa, 20 kDa, 10 kDa. The particles in a composition need not be of uniform diameter. By way of example, a pharmaceutical formulation may contain a plurality of particles, some of which are about 0.5 μm, while others are about 1.0 μm. Any mixture of particle sizes within these given ranges will be useful.

[0108] The particles of the current invention can possess a particular zeta potential. In certain embodiments, the zeta potential is negative. In one embodiment, the zeta potential is less than about -100 mV. In one embodiment, the zeta potential is less than about -50 mV. In certain embodiments, the particles possess a zeta potential between -100 mV and 0 mV. In a further embodiment, the particles possess a zeta potential between -75 mV and 0 mV. In a further embodiment, the particles possess a zeta potential between -60 mV and 0 mV. In a further embodiment, the particles possess a zeta potential between -50 mV and 0 mV. In still a further embodiment, the particles possess a zeta potential between -40 mV and 0 mV. In a further embodiment, the particles possess a zeta potential between -30 mV and 0 mV. In a further embodiment, the particles possess a zeta potential between -20 mV and +0 mV. In a further embodiment, the particles possess a zeta potential between -10 mV and -0 mV. In a further embodiment, the particles possess a zeta potential between -100mV and -50mV. In another particular embodiment, the particles possess a zeta potential between -75 mV and -50mV. In a particular embodiment, the particles possess a zeta potential between -50 mV and -40mV.

[0109] In some embodiments, the charge of a carrier (e.g., positive, negative, neutral) is selected to impart application-specific benefits (e.g., physiological compatibility, beneficial surface-peptide interactions, etc.). In some embodiments, a carrier has a net neutral or negative charge (e.g., to reduce non-specific binding to cell surfaces which, in general, bear a net negative charge). In certain embodiments carrier polymers are capable of being covalently conjugated, either directly or indirectly, to an antigen to which tolerance is desired (also referred to herein as an antigen-specific peptide, antigenic peptide, autoantigen, inducing antigen or tolerizing antigen). In some embodiments, carrier polymer-antigen conjugates are mixed with unconjugated carrier polymer at predetermined mixing ratios. In some embodiments, the predetermined mixing ratios can be 5:95, 10:90, 15:85, 20:80, 25:75,

30:70, 35:65, 40:60, 45:55, 50:50, 55:45, 60:40, 65:35, 70:30, 75:25, 80:20, 85:15, 90:10, or 95:5. In some embodiments, the predetermined mixing ratio is 50:50. In some instances, a carrier has multiple binding sites (e.g., 2, 3, 4, 5, 6, 7, 8, 9, 10… 20… 50… 100, or more) in order to have multiple copies of an antigen-specific peptide, or multiple different peptides encapsulated within the carrier particle (e.g., to increase the likelihood of a tolerance response). In some embodiments, a carrier encapsulates a single type of antigenic peptide. In some embodiments, a carrier encapsulates multiple different antigenic peptides.

[0110] In some embodiments, the loading of antigen is about 0.10, 0.20, 0.30, 0.40, 0.50, 0.60, 0.70, 0.80, 0.90, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 μg antigen/mg carrier polymer and all values in between. In some embodiments, the loading of antigen is about 0.10 to about 0.50 μg antigen/mg carrier polymer. In some embodiments, the loading of antigen is about 0.50 to about 2 μg antigen/mg carrier polymer. In some embodiments, the loading of antigen is about 2 to about 4 μg antigen/mg carrier polymer. In some embodiments, the loading of antigen is about 4 to about 8 μg antigen/mg carrier polymer. In some embodiments, the loading of antigen is about 8 to about 16 μg antigen/mg carrier polymer. In some embodiments, the loading of antigen is about 16 to about 20 μg antigen/mg carrier polymer. In some embodiments, the loading of antigen is about 20 to about 30 μg antigen/mg carrier polymer. In some embodiments, the loading of antigen is about 30 to about 40 μg antigen/mg carrier polymer. In some embodiments, the loading of antigen is about 40 to about 50 μg antigen/mg carrier polymer. In some embodiments, the loading of antigen is about 50 to about 60 μg antigen/mg carrier polymer. In some embodiments, the loading of antigen is about 60 to about 70 μg antigen/mg carrier polymer. In some embodiments, the loading of antigen is about 70 μg antigen or more/mg carrier polymer.

[0111] The size and charge of the particles are critical for tolerance induction. While the particles will differ in size and charge based on the antigen encapsulated within them (See Table 1 and Table 5 for examples of specific particles), in general, particles of the current invention are effective at inducing tolerance when they are between about 100 nanometers and about 1500 nanometers and have a charge of 0 to about -100 mV and are most effective at inducing tolerance when they are 400-800 microns and have a charge of between about -25mV and -70mV. As used herein, the term “post-synthesis size” and “post synthesis charge” refer to the size and charge of the particle prior to lyophilization. The term “post lyophilization size” and “post lyophilization charge” refer to the size and charge of the particle after lyophilization. Table 1 shows the sizes and zeta potentials of representative

nanoparticle formulations. Particles with various sizes were prepared by the double emulsion and nanoprecipitation methods. Loading (μg antigen (Ag)/mg PLG) was precisely controlled by combining PLG-Ag conjugates with unconjugated PLG at predetermined mixing ratios. Tables 1 and 5 show sizes and zeta potentials of representative nanoparticle formulations.

Table 1. Sizes and zeta potentials of representative nanoparticle formulations

Type	Particle	Loading (μg/mg)	Size (nm ± S.D.)	Zeta (mV ± S.D.)
Double Emulsion	PLG	0	521.5 ± 23.	-56.0 ± 0.67
	PLG-Cy5.5	0	454.8 ± 26.	-39.7 ± 0.47
	PLG-OVA	0.1	406.0 ± 6.4	-52.2 ± 1.1
	PLG-OVA	0.5	456.5 ± 9.3	-34.9 ± 2.0
	PLG-OVA	2	421.2 ± 1.5	-58.1 ± 2.9
	PLG-OVA	8	443.7 ± 7.8	-52.6 ± 1.2
	PLG-PLP	8	656.5 ± 13.7	-45.5 ± 1.4
	PLG-OVA	16	470.7 ± 15.	-50.5 ± 2.3
Nanoprecipitation	PLG	0	72.2 ± 1.9	-33.5 ± 1.1
	PLG-Cy5.5	0	79.04 ± 0.78	-31.3 ± 0.55
	PLG-OVA	0.1	74.8 ± 0.25	-34.5 ± 0.25
	PLG-OVA	0.5	85.6 ± 1.9	-31.5 ± 1.2
	PLG-OVA	1	103.9 ± 0.25	-32.4 ± 0.56
	PLG-OVA	2	112.0 ± 0.60	-32.0 ± 0.85

[0112] In some embodiments, the particle is non-metallic. In these embodiments the particle may be formed from a polymer. In a preferred embodiment, the particle is biodegradable in an individual. In this embodiment, the particles can be provided in an individual across multiple doses without there being an accumulation of particles in the individual. Examples of suitable particles include polystyrene particles, PLGA particles, PLURONIC® stabilized polypropylene sulfide particles, and diamond particles. In some embodiments, suitable particles include particles prepared from general classes of polymers such as poly(alpha-esters), polyurethanes, poly(ester amide), poly(ortho esters), polyanhydrides, poly(anhydride-co-imide), cross-linked polyanhydrides, poly(propylene fumarate), psuedo poly(amino acid), poly(alkyl cyanoacrylates), polyphosphazenes, polyphosphoester, poly(amino acids), and polysaccharides.

[0113] Preferably the particle surface is composed of a material that minimizes non-specific or unwanted biological interactions. Interactions between the particle surface and the interstitium may be a factor that plays a role in lymphatic uptake. The particle surface may be

coated with a material to prevent or decrease non-specific interactions. Steric stabilization by coating particles with hydrophilic layers such as poly(ethylene glycol) (PEG) and its copolymers such as PLURONIC® (including copolymers of poly(ethylene glycol)-bl-poly(propylene glycol)-bl-poly(ethylene glycol)) may reduce the non-specific interactions with proteins of the interstitium as demonstrated by improved lymphatic uptake following subcutaneous injections. All of these facts point to the significance of the physical properties of the particles in terms of lymphatic uptake. Biodegradable polymers may be used to make all or some of the polymers and/or particles and/or layers. Biodegradable polymers may undergo degradation, for example, by a result of functional groups reacting with the water in the solution. The term "degradation" as used herein refers to becoming soluble, either by reduction of molecular weight or by conversion of hydrophobic groups to hydrophilic groups. Polymers with ester groups are generally subject to spontaneous hydrolysis, e.g., polylactides and polyglycolides.

[0114] Particles of the present invention may also contain additional components. For example, carriers may have imaging agents incorporated or conjugated to the carrier. An example of a carrier nanosphere having an imaging agent that is currently commercially available is the Kodak X-sight nanospheres. Inorganic quantum-confined luminescent nanocrystals, known as quantum dots (QDs), have emerged as ideal donors in FRET applications: their high quantum yield and tunable size-dependent Stokes Shifts permit different sizes to emit from blue to infrared when excited at a single ultraviolet wavelength. (Bruchez, et al., Science, 1998, 281, 2013; Niemeyer, C. M Angew. Chem. Int. Ed. 2003, 42, 5796; Waggoner, A. Methods Enzymol. 1995, 246, 362; Brus, L. E. J. Chem. Phys. 1993, 79, 5566). Quantum dots, such as hybrid organic/inorganic quantum dots based on a class of polymers known as dendrimers, may used in biological labeling, imaging, and optical biosensing systems. (Lemon, et al., J. Am. Chem. Soc. 2000, 122, 12886). Unlike the traditional synthesis of inorganic quantum dots, the synthesis of these hybrid quantum dot nanoparticles does not require high temperatures or highly toxic, unstable reagents. (Etienne, et al., Appl. Phys. Lett. 87, 181913, 2005).

[0115] Particles of the present invention may be covalently linked to an imaging agent such as a cyanine fluorescent dye. In some embodiments, the cyanines comprise open chain cyanines, hemicyanines and/or closed chain cyanines. In some embodiments, the cyanine fluorescent dye comprises Cy2, Cy3, Cy3B, Cy3.5, Cy5, Cy5.5 and Cy7. In some embodiments, the particles are covalently linked to Cy5.5 for *in vivo* imaging.

[0116] Particles can be formed from a wide range of materials. The particle is preferably composed of a material suitable for biological use. For example, particles may be composed of glass, silica, polyesters of hydroxy carboxylic acids, polyanhydrides of dicarboxylic acids, or copolymers of hydroxy carboxylic acids and dicarboxylic acids. More generally, the carrier particles may be composed of polyesters of straight chain or branched, substituted or unsubstituted, saturated or unsaturated, linear or cross-linked, alkanyl, haloalkyl, thioalkyl, aminoalkyl, aryl, aralkyl, alkenyl, aralkenyl, heteroaryl, or alkoxy hydroxy acids, or polyanhydrides of straight chain or branched, substituted or unsubstituted, saturated or unsaturated, linear or cross-linked, alkanyl, haloalkyl, thioalkyl, aminoalkyl, aryl, aralkyl, alkenyl, aralkenyl, heteroaryl, or alkoxy dicarboxylic acids. Additionally, carrier particles can be quantum dots, or composed of quantum dots, such as quantum dot polystyrene particles (Joumaa et al. (2006) Langmuir 22: 1810-6). Carrier particles including mixtures of ester and anhydride bonds (e.g., copolymers of glycolic and sebacic acid) may also be employed. For example, carrier particles may comprise materials including polyglycolic acid polymers (PGA), polylactic acid polymers (PLA), polysebacic acid polymers (PSA), poly(lactic-co-glycolic) acid copolymers (PLGA or PLG; the terms are interchangeable), [rho]oly(lactic-co-sebacic) acid copolymers (PLSA), poly(glycolic-co-sebacic) acid copolymers (PGSA), polypropylene sulfide polymers, poly(caprolactone), chitosan, etc. Other biocompatible, biodegradable polymers useful in the present invention include polymers or copolymers of caprolactones, carbonates, amides, amino acids, orthoesters, acetals, cyanoacrylates and degradable urethanes, as well as copolymers of these with straight chain or branched, substituted or unsubstituted, alkanyl, haloalkyl, thioalkyl, aminoalkyl, alkenyl, or aromatic hydroxy- or di-carboxylic acids. In addition, the biologically important amino acids with reactive side chain groups, such as lysine, arginine, aspartic acid, glutamic acid, serine, threonine, tyrosine and cysteine, or their enantiomers, may be included in copolymers with any of the aforementioned materials to provide reactive groups for conjugating to antigen peptides and proteins or conjugating moieties. Biodegradable materials suitable for the present invention include diamond, PLA, PGA, polypropylene sulfide, and PLGA polymers. Biocompatible but non-biodegradable materials may also be used in the carrier particles of the invention. For example, non-biodegradable polymers of acrylates, ethylene-vinyl acetates, acyl substituted cellulose acetates, non-degradable urethanes, styrenes, vinyl chlorides, vinyl fluorides, vinyl imidazoles, chlorosulphonated olefins, ethylene oxide, vinyl alcohols, TEFLON® (DuPont, Wilmington, Del.), and nylons may be employed.

Preparation of compositions

[0117] The particles of the instant invention can be manufactured by any means commonly known in the art. Exemplary methods of manufacturing particles include, but are not limited to, microemulsion polymerization, interfacial polymerization, precipitation polymerization, emulsion evaporation, emulsion diffusion, solvent displacement, and salting out (Astete and Sabliov, J. Biomater. Sci. Polymer Edn., 17:247-289(2006)). Manipulation of the manufacturing process for PLGA particles can control particle properties (e.g. size, size distribution, zeta potential, morphology, hydrophobicity/hydrophilicity, polypeptide entrapment, etc). The size of the particle is influenced by a number of factors including, but not limited to, the concentration of PLGA, the solvent used in the manufacture of the particle, the nature of the organic phase, the surfactants used in manufacturing, the viscosity of the continuous and discontinuous phase, the nature of the solvent used, the temperature of the water used, sonication, evaporation rate, additives, shear stress, sterilization, and the nature of any encapsulated antigen or polypeptide.

[0118] Particle size is affected by the polymer concentration; higher particles are formed from higher polymer concentrations. For example, an increase in PLGA concentration from 1% to 4% (w/v) can increase mean particle size from about 205 nm to about 290 nm when the solvent propylene carbonate is used. Alternatively, in ethyl acetate and 5% Pluronic F-127, an increase in PLGA concentration from 1% to 5% (w/v) increases the mean particle size from 120 nm to 230 nm.

[0119] The viscosity of the continuous and discontinuous phase is also an important parameter that affects the diffusion process, a key step in forming smaller particles. The size of the particles increases with an increase in viscosity of the dispersed phase, whereas the size of the particles decreases with a more viscous continuous phase. In general, the lower the phase ratio of organic to aqueous solvent, the smaller the particle size.

[0120] Homogenizer speed and agitation also affect particle size; in general, higher speeds and agitation cause a decrease in particle size, although there is a point where further increases in speed and agitation no longer decrease particle size. There is a favorable impact in the size reduction when the emulsion is homogenized with a high pressure homogenizer compared with just high stirring. For example, at a phase ratio of 20% in 5% PVA, the mean particle size with stirring is 288 nm and the mean particle size with homogenization (high pressure of 300 bars) is 231 nm.

[0121] An important size reduction of the particles can be achieved by varying the temperature of the water added to improve the diffusion of the solvent. The mean particle size decreases with an increase in water temperature.

[0122] The nature of the polypeptide encapsulated in the particle also affects particle size. In general, encapsulation of hydrophobic polypeptides leads to the formation of smaller particles compared with the encapsulation of more hydrophilic polypeptides. In the double emulsion process, the entrapment of more hydrophilic polypeptides is improved by using high molecular mass PLGA and a high molecular mass of the first surfactant which causes a higher inner phase viscosity. The interaction between the solvent, polymer, and polypeptide affects the efficiency of incorporating the polypeptide into the particle.

[0123] The PLGA molecular mass impacts the final mean particle size. In general, the higher the molecular mass, the higher the mean particle size. For example, as the composition and molecular mass of PLGA varies (e.g. 12 to 48 kDa for 50 : 50 PLGA; 12 to 98 kDa for 75 : 25 PLGA) the mean particle size varies (about 102 nm -154 nm; about 132 nm to 152 nm respectively). Even when particles are the same molecular mass, their composition can affect average particle size; for example, particles with a 50 : 50 ratio generally form particles smaller than those with a 75 : 25 ratio. The end groups on the polymer also affect particle size. For example, particles prepared with ester end-groups form particles with an average size of 740nm (PI=0.394) compared with the mean size for the acid PLGA end-group is 240 nm (PI=0.225).

[0124] The solvent used can also affect particle size; solvents that reduce the surface tension of the solution also reduce particle size.

[0125] The organic solvent is removed by evaporation in a vacuum to avoid polymer and polypeptide damage and to promote final particle size reduction. Evaporation of the organic solvent under vacuum is more efficient in forming smaller particles. For example, evaporation in vacuum produces a mean particle size around 30% smaller than the mean particle size produced under a normal rate of evaporation.

[0126] The amplitude of the sonication wavelength also affects the particle characteristics. The amplitude of the wavelength should be over 20% with 600 to 800 s of sonication to form stable miniemulsions with no more droplet size changes. However, the main draw-back of sonication is the lack of monodispersity of the emulsion formed.

[0127] Organic phases that may be used in the production of the particles of the invention include, but are not limited to, methylene chloride, ethyl acetate, methyl ethyl ketone,

propylene carbonate, and benzyl alcohol. The continuous phases that may be used include, but are not limited to, the surfactant poloxamer 188.

[0128] A variety of surfactants can be used in the manufacturing of the particles of the invention. The surfactant can be anionic, cationic, or nonionic. Surfactants in the poloxamer and poloaxamines family are commonly used in particle synthesis. Surfactants that may be used, include, but are not limited to PEG, Tween-80, gelatin, dextran, pluronic L-63, PVA, methylcellulose, lecithin, DMAB, PEMA, sodium deoxycholate, poly(acrylic acid), hyaluronic acid, and other negatively-charged naturally occurring or synthetic small molecules or polymers. Additionally, biodegradable and biocompatible surfactants including, but not limited to, vitamin E TPGS (D-α-tocopheryl polyethylene glycol 1000 succinate). In certain embodiments, two surfactants are needed (e.g. in the double emulsion evaporation method). These two surfactants can include a hydrophobic surfactant for the first emulsion, and a hydrophobic surfactant for the second emulsion.

[0129] Another manufacturing technique includes nanoprecipitation. For example, a polymer is soluble in an organic solvent, yet the organic solvent is miscible with the aqueous phase. Upon mixing the organic (polymer-containing solution) with the aqueous phase, the polymer can precipitate and form particles since the aqueous phase is a non-solvent for the polymer.

[0130] Solvents that may be used in the production of the particles of the invention include, but are not limited to, ethyl acetate, acetone, Tetrahydrofuran (THF), chloroform, and members of the chlorinate family, methylene chloride. The choice of organic solvents require two selection criteria: the polymer must be soluble in this solvent, and the solvent must be completely immiscible with the aqueous phase.

[0131] Salts that may be used in the production of the particles of the invention include, but are not limited to magnesium chloride hexahydrate, magnesium acetate tetrahydrate.

[0132] Common salting-out agents include, but are not limited to, electrolytes (e.g. sodium chloride, magnesium acetate, magnesium chloride), or non-electrolytes (e.g. sucrose).

[0133] The stability and size of the particles of the invention may be improved by the addition of compounds including, but not limited to, fatty acids or short chains of carbons. The addition of the longer carbon chain of lauric acid is associated with the improvement of particle characteristics. Furthermore, the addition of hydrophobic additives can improve the particle size, incorporation of the polypeptide into the particle, and release profile. Preparations of particles can be stabilized by lyophilization. The addition of a cryoprotectant such as trehalose can decrease aggregation of the particles upon lyophilization.

[0134] Suitable beads which are currently available commercially include polystyrene beads such as FluoSpheres (Molecular Probes, Eugene, Oreg.).

[0135] In some embodiments, the present invention provides systems comprising: (a) a delivery scaffold configured for the delivery of chemical and/or biological agents to a subject; and (b) antigen-coupled poly(lactide-*co*-glycolide) particles for induction of antigen-specific tolerance. In some embodiments, at least a portion of said delivery scaffold is microporous. In some embodiments, the antigen-coupled poly(lactide-*co*-glycolide) particles are encapsulated within said scaffold. In some embodiments, the chemical and/or biological agents are selected from the group consisting of: protein, peptide, small molecules, nucleic acids, cells, and particles. In some embodiments, chemical and/or biological agents comprise cell, and said cells comprise pancreatic islet cells.

[0136] Physical properties are also related to a nanoparticle's usefulness after uptake and retention in areas having immature lymphocytes. These include mechanical properties such as rigidity or rubberiness. Some embodiments are based on a rubbery core, e.g., a poly(propylene sulfide) (PPS) core with an overlayer, e.g., a hydrophilic overlayer, as in PEG, as in the PPS-PEG system recently developed and characterized for systemic (but not targeted or immune) delivery. The rubbery core is in contrast to a substantially rigid core as in a polystyrene or metal nanoparticle system. The term rubbery refers to certain resilient materials besides natural or synthetic rubbers, with rubbery being a term familiar to those in the polymer arts. For example, cross-linked PPS can be used to form a hydrophobic rubbery core. PPS is a polymer that degrades under oxidative conditions to polysulphoxide and finally polysulphone, transitioning from a hydrophobic rubber to a hydrophilic, water-soluble polymer. Other sulphide polymers may be adapted for use, with the term sulphide polymer referring to a polymer with a sulphur in the backbone of the mer. Other rubbery polymers that may be used are polyesters with glass transition temperature under hydrated conditions that is less than about 37° C. A hydrophobic core can be advantageously used with a hydrophilic overlayer since the core and overlayer will tend not to mingle, so that the overlayer tends to sterically expand away from the core. A core refers to a particle that has a layer on it. A layer refers to a material covering at least a portion of the core. A layer may be adsorbed or covalently bound. A particle or core may be solid or hollow. Rubbery hydrophobic cores are advantageous over rigid hydrophobic cores, such as crystalline or glassy (as in the case of polystyrene) cores, in that higher loadings of hydrophobic drugs can be carried by the particles with the rubbery hydrophobic cores.

[0137] Another physical property is the surface's hydrophilicity. A hydrophilic material may have a solubility in water of at least 1 gram per liter when it is uncrosslinked. Steric stabilization of particles with hydrophilic polymers can improve uptake from the interstitium by reducing non-specific interactions; however, the particles' increased stealth nature can also reduce internalization by phagocytic cells in areas having immature lymphocytes. The challenge of balancing these competing features has been met, however, and this application documents the creation of nanoparticles for effective lymphatic delivery to DCs and other APCs in lymph nodes. Some embodiments include a hydrophilic component, e.g., a layer of hydrophilic material. Examples of suitable hydrophilic materials are one or more of polyalkylene oxides, polyethylene oxides, polysaccharides, polyacrylic acids, and polyethers. The molecular weight of polymers in a layer can be adjusted to provide a useful degree of steric hindrance in vivo, e.g., from about 1,000 to about 100,000 or even more; artisans will immediately appreciate that all the ranges and values within the explicitly stated ranges are contemplated, e.g., between 10,000 and 50,000.

[0138] The nanoparticles may incorporate functional groups for further reaction. Functional groups for further reaction include electrophiles or nucleophiles; these are convenient for reacting with other molecules. Examples of nucleophiles are primary amines, thiols, and hydroxyls. Examples of electrophiles are succinimidyl esters, aldehydes, isocyanates, and maleimides.

[0139] A great variety of means, well known in the art, may be used to conjugate antigenic peptides and proteins to carrier polymers. These methods include any standard chemistries which do not destroy or severely limit the biological activity of the antigen peptides and proteins, and which allow for a sufficient number of antigen peptides and proteins to be conjugated to the carrier polymer in an orientation which allows for interaction of the antigen peptide or protein with a cognate T cell receptor. Generally, methods are preferred which conjugate the C-terminal regions of an antigen peptide or protein, or the C-terminal regions of an antigen peptide or protein fusion protein, to the earner. The exact chemistries will, of course, depend upon the nature of the earner material, the presence or absence of C-terminal fusions to the antigen peptide or protein, and/or the presence or absence of conjugating moieties.

[0140] Functional groups can be located on the carrier polymer as needed for availability. One location can be as side groups or termini on the core polymer or polymers that are layers on a core or polymers otherwise tethered to the particle. For instance, examples are included

herein that describe PEG stabilizing the nanoparticles that can be readily functionalized for specific cell targeting or protein and peptide drug delivery.

Conjugation procedure

[0141] The present disclosure provides conjugates of carrier particles (e.g., carrier polymers). The polymer is typically a chemical species containing a plurality of repeating units that are bonded to each other. A polymer may contain more than one different repeating unit. The repeating unit typically derives from polymerization of a monomer. A copolymer specifically refers to a polymer containing two or more structurally different repeating units. The different repeating units of a polymer may be randomly ordered in the polymer chain or the same repeating units may be grouped into contiguous blocks in the polymer. When there are contiguous blocks of the two or more repeating units in a polymer, the polymer is a block co-polymer. In certain embodiments, the polymer is a graft co-polymer. As used herein the term polymer refers to a chemical species containing more than about 10 repeating units.

[0142] Suitable carrier particle (e.g., carrier polymer) for conjugation comprises functional group for reaction. The carrier particle (e.g., carrier polymer) described herein can be chemically modified by reactions to introduce a desired terminal functional group. Terminal functional groups include among others, carboxyl, hydroxyl, thiol, amine, azide, alkyne, alkene, ketone, phenol, halide, imidazole, guanidinium, carboxylate, or phosphate groups. These functional groups can be introduced at the terminus of the carrier particle (e.g., carrier polymer) herein employing well known chemical methods.

[0143] The functional groups can be employed to further conjugate the carrier particle (e.g., carrier polymer) with other chemical species, such as other polymers, other oligomers, peptides, proteins, small molecules, carbohydrates, antibodies, nucleic acids, and/or aptamers.

[0144] In certain embodiments, the carrier particle (e.g., carrier polymer) comprises a carboxyl group, which can be conjugated to an amino-containing conjugate partner with use of carbodiimide crosslinking chemistry. Carbodiimide reagents are used as coupling reagents for reaction of carboxylic acids towards amide or ester formation. Examples of carbodiimide reagents include EDCI (1-ethyl-3-(3-dimethylaminopropyl)carbodiimide, or EDC, or ECDI), DCC (N,N'-dicyclohexylcarbodiimide), and DIC (N,N'-diisopropylcarbodiimide). In addition to the coupling reagent, activation reagents may be used to facilitate the reaction. Examples of activating reagents include hydroxysuccinimide. Reaction of carbodiimide-activated carboxylic acid on a carrier particle (e.g., carrier polymer) with an amino-containing

conjugate partner can produce an amide bond connecting the carrier polymer and conjugate partner.

[0145] In certain embodiments, the carrier particle (e.g., carrier polymer) and the conjugate partner (e.g., antigen) are coupled with use of polyfunctional coupling reagents (e.g., bifunctional coupling reagents). The selection of the polyfunctional coupling reagent depends on the functional groups present on the carrier particle (e.g., carrier polymer) and the conjugate partner (e.g., antigen).

[0146] The groups of the polyfunctional coupling reagent can independently include a carboxyl-reactive group, carbonyl-reactive group, an amine-reactive group, a thiol-reactive group or a photo-reactive group, but are not the same (e.g., orthogonal). Examples of carboxyl-reactive groups include hydrazine derivatives and amines. Examples of carbonyl-reactive groups include aldehyde- and ketone-reactive groups like hydrazine derivatives and amines. Examples of amine-reactive groups include active esters such as NHS or sulfo-NHS, isothiocyanates, isocyanates, acyl azides, sulfonyl chlorides, aldehydes, glyoxals, epoxides, oxiranes, carbonates, aryl halides, imidoesters, anhydrides and the like. Examples of thiol-reactive groups include non-polymerizable Michael acceptors, haloacetyl groups (such as iodoacetyl), alkyl halides, maleimides, aziridines, acryloyl groups, vinyl sulfones, benzoquinones, aromatic groups that can undergo nucleophilic substitution such as fluorobenzene groups (such as tetra and pentafluorobenzene groups), and disulfide groups such as pyridyl disulfide groups and thiols activated with Ellman's reagent. Examples of photo-reactive groups include aryl azide and halogenated aryl azides. Additional examples of each of these types of groups will be apparent to those skilled in the art. Further examples and information regarding reaction conditions and methods for exchanging one type of reactive group for another are provided in Hermanson, "Bioconjugate Techniques," Academic Press, San Diego, 1996, which is incorporated by reference herein.

Alternate conjugation procedure

[0147] Conjugates such as ethylene carbodiimide (EDCI), hexamethylene diisocyanate, propyleneglycol di-glycidylether which contain 2 epoxy residues, and epichlorohydrin may be used for fixation of peptides or proteins to the carrier polymer. Without being bound by theory, EDCI is suspected of carrying out two major functions for induction of tolerance: (a) it chemically couples the protein/peptides to the carrier polymer via catalysis of peptide bond formation between free amino and free carboxyl groups; and (b) it induces the carrier to mimic apoptotic cell death such that they are picked up by host antigen presenting cells

(which may include endothelial cells) in the spleen and induce tolerance. It is this presentation to host T-cells in a non-immunogenic fashion that leads to direct induction of anergy in autoreactive cells. In addition, EDCI serves as a potent stimulus for the induction of specific regulatory T cells.

[0148] In one series of embodiments, the antigen peptides and proteins are bound to the carrier polymer via a covalent chemical bond. For example, a reactive group or moiety near the C-terminus of the antigen (e.g., the C-terminal carboxyl group, or a hydroxyl, thiol, or amine group from an amino acid side chain) may be conjugated directly to a reactive group or moiety of the carrier polymer (e.g., a hydroxyl or carboxyl group of a PLA or PGA polymer, a terminal amine or carboxyl group of a dendrimer, or a hydroxyl, carboxyl or phosphate group of a phospholipid) by direct chemical reaction. Alternatively, there may be a conjugating moiety which covalently conjugates to both the antigen peptides and proteins and the carrier polymer, thereby linking them together.

[0149] Reactive carboxyl groups of a carrier polymer may be joined to free amines (e.g., from Lys residues) on the antigen peptide or protein, by reacting them with, for example, 1 -ethyl-3-[3,9-dimethyl aminopropyl] carbodiimide hydrochloride (EDC) or N-hydroxysuccinimide ester (NHS). Similarly, the same chemistry may be used to conjugate free amines on the surface of a carrier polymer with free carboxyls (e.g., from the C-terminus, or from Asp or Glu residues) on the antigen peptide or protein. Alternatively, free amine groups on a carrier polymer may be covalently bound to antigen peptides and proteins, or antigen peptide or protein fusion proteins, using sulfo-SIAB chemistry, essentially as described by Arano et al. (199I) Chem. 2:71-6.

[0150] Conjugation of a nucleic acid moiety to a platform molecule can be effected in any number of ways, typically involving one or more crosslinking agents and functional groups on the nucleic acid moiety and platform molecule. Linking groups are added to platforms using standard synthetic chemistry techniques. Linking groups can be added to nucleic acid moieties using standard synthetic techniques. The practitioner has a number of choices for antigens used in the combinations of this invention. The inducing antigen present in the combination contributes to the specificity of the tolerogenic response that is induced. It may or may not be the same as the target antigen, which is the antigen present or to be placed in the subject being treated which is a target for the unwanted immunological response, and for which tolerance is desired.

Biological and Chemical Antigens

[0151] An inducing antigen of this invention may be a polypeptide, polynucleotide, carbohydrate, glycolipid, or other molecule isolated from a biological source, or it may be a chemically synthesized small molecule, polymer, or derivative of a biological material, providing it has the ability to induce tolerance according to this description when combined with the mucosal binding component.

[0152] In some embodiments, the present invention provides a carrier polymer covalently coupled to one or more peptides, polypeptides, and/or proteins. In some embodiments, a carrier (e.g., PLG carrier), such as those described herein, are effective to induce antigen-specific tolerance and/or prevent the onset of an immune related disease (such as EAE in a mouse model) and/or diminish the severity of a pre-existing immune related disease. In some embodiments, the compositions and methods of the present invention can cause T cells to undertake early events associated with T-cell activation, but do not allow T-cells to acquire effector function. For example, administration of compositions of the present invention can result in T-cells having a quasi-activated phenotype, such as CD69 and/or CD44 upregulation, but do not display effector function, such as indicated by a lack of IFN-γ or IL-17 synthesis. In some embodiments, administration of compositions of the present invention results in T-cells having a quasi-activated phenotype without having conversion of naive antigen-specific T-cells to a regulatory phenotype, such as those having $CD25^{+/}Foxp3^{+}$ phenotypes.

[0153] In some embodiments, a carrier comprises one or more biological or chemical agents adhered to, adsorbed on, encapsulated within, and/or contained throughout the carrier. In some embodiments, a chemical or biological agent is encapsulated in and/or contained throughout the particles. The present invention is not limited by the nature of the chemical or biological agents. Such agents include, but are not limited to, proteins, nucleic acid molecules, small molecule drugs, lipids, carbohydrates, cells, cell components, and the like. In some embodiments, two or more (e.g., 3, 4, 5, etc.) different chemical or biological agents are included on or within the carrier. In some embodiments, agents are configured for specific release rates. In some embodiments, multiple different agents are configured for different release rates. For example, a first agent may release over a period of hours while a second agent releases over a longer period of time (e.g., days, weeks, months, etc.). In some embodiments, the carrier or a portion thereof is configured for slow-release of biological or chemical agents. In some embodiments, the slow release provides release of biologically

active amounts of the agent over a period of at least 30 days (e.g., 40 days, 50 days, 60 days, 70 days, 80 days, 90 days, 100 days, 180 days, etc.). In some embodiments, the carrier or a portion thereof is configured to be sufficiently porous to permit ingrowth of cells into the pores. The size of the pores may be selected for particular cell types of interest and/or for the amount of ingrowth desired. In some embodiments, the particles comprise the antigen of interest without other non-peptide active agents, such as drugs or immunomodulators. Furthermore, in some embodiments the particles of the invention do not contain immunostimulatory or immunosuppressive peptides in addition to the antigen of interest. Furthermore, in some embodiments, the particles do not contain other proteins or peptides (*e.g.* costimulatory molecules, MHC molecules, immunostimulatory peptides or immunosuppressive peptides) either on the surface or encapsulated within the particle.

[0154] Encapsulation of the antigen, biological, and/or chemical agents in the particle of the invention has been surprisingly found to induce immunological tolerance and has several advantages. First, the encapsulated particles have a slower cytokine response. Second, when using multiple antigens, biological, and/or chemical agents, encapsulation removes the competition between these various molecules that might occur if the agents were attached to the surface of the particle. Third, encapsulation allows more antigens, biological, and/or chemical agents to be incorporated with the particle. Fourth, encapsulation allows for easier use of complex protein antigens or organ homogenates (e.g. pancreas homogenate for type 1 diabetes or peanut extract in peanut allergy). Finally, encapsulation of antigens, biological, and/or chemical agents within the particle instead of conjugation to the surface of the particle maintains the net negative charge on the surface of the particle. The encapsulation of the antigen, biological, and/or chemical agents in the particles of the invention may be performed by any method known in the art. In one embodiment, polypeptide antigens are encapsulated in the particles by a double-emulsion process. In a further embodiment, the polypeptide antigens are water soluble.

[0155] In another embodiment, the polypeptide antigens are encapsulated in the particles by a single-emulsion process. In a further embodiment, the polypeptide antigens are more hydrophobic. Sometimes, the double emulsion process leads to the formation of large particles which may result in the leakage of the hydrophilic active component and low entrapment efficiencies. The coalescence and Ostwald ripening are two mechanisms that may destabilize the double-emulsion droplet, and the diffusion through the organic phase of the hydrophilic active component is the main mechanism responsible of low levels of entrapped active component. In some embodiments, it may be beneficial to reduce the nanoparticle size.

One strategy to accomplish this is to apply a second strong shear rate. The leakage effect can be reduced by using a high polymer concentration and a high polymer molecular mass, accompanied by an increase in the viscosity of the inner water phase and in increase in the surfactant molecular mass.

[0156] In certain embodiments, the present invention provides carriers having thereon (or therein) cells or other biological or chemical agents. Where cells are employed, the carriers are not limited to a particular type of cells. In some embodiments, the carriers have thereon pancreatic islet cells. In some embodiments, the microporous carriers additionally have thereon ECM proteins and/or exendin-4. The carriers are not limited to a particular type. In some embodiments, a carrier has regions of varying porosity (e.g., varying pore size, pore depth, and/or pore density). In some embodiments, carriers have thereon (or therein) pharmaceutical agents, DNA, RNA, extracellular matrix proteins, exendin-4, etc. In certain embodiments, the present invention provides methods for transplanting pancreatic islet cells with such carriers. In certain embodiments of this invention, the inducing antigen is a single isolated or recombinantly produced molecule. For treating conditions where the target antigen is disseminated to various locations in the host, it is generally necessary that the inducing antigen be identical to or immunologically related to the target antigen. Examples of such antigens are most polynucleotide antigens, and some carbohydrate antigens (such as blood group antigens).

[0157] Any suitable antigens may find use within the scope of the present invention. In some embodiments, the inducing antigen contributes to the specificity of the tolerogenic response that is induced. The inducing antigen may or may not be the same as the target antigen, which is the antigen present or to be placed in the subject being treated which is a target for the unwanted immunological response, and for which tolerance is desired.

[0158] Where the target antigen is preferentially expressed on a particular organ, cell, or tissue type, the practitioner again has the option of using an inducing antigen which is identical with or immunologically related to the target antigen. However, there is also the additional option of using an antigen which is a bystander for the target. This is an antigen which may not be immunologically related to the target antigen, but is preferentially expressed in a tissue where the target antigen is expressed. A working theory as to the effectiveness of bystander suppression is that suppression is an active cell-mediated process that down-regulates the effector arm of the immune response at the target cells. The suppressor cells are specifically stimulated by the inducer antigen at the mucosal surface, and home to a tissue site where the bystander antigen is preferentially expressed. Through an

interactive or cytokine-mediated mechanism, the localized suppressor cells then down-regulate effector cells (or inducers of effector cells) in the neighborhood, regardless of what they are reactive against. If the effector cells are specific for a target different from the inducing antigen, then the result is a bystander effect. For further elaboration of the bystander reaction and a list of tolerogenic peptides having this effect, the reader is referred to International Patent Publication WO 93/16724. An implication of bystander theory is that one of ordinary skill need not identify or isolate a particular target antigen against which tolerance is desired in order to practice the present invention. The practitioner need only be able to obtain at least one molecule preferentially expressed at the target site for use as an inducing antigen.

[0159] In certain embodiments of this invention, the inducing antigen is not in the same form as expressed in the individual being treated, but is a fragment or derivative thereof. Inducing antigens of this invention include peptides based on a molecule of the appropriate specificity but adapted by fragmentation, residue substitution, labeling, conjugation, and/or fusion with peptides having other functional properties. The adaptation may be performed for any desirable purposes, including but not limited to the elimination of any undesirable property, such as toxicity or immunogenicity; or to enhance any desirable property, such as mucosal binding, mucosal penetration, or stimulation of the tolerogenic arm of the immune response. Terms such as insulin peptide, collagen peptide, and myelin basic protein peptide, as used herein, refer not only to the intact subunit, but also to allotypic and synthetic variants, fragments, fusion peptides, conjugates, and other derivatives that contain a region that is homologous (preferably 70% identical, more preferably 80% identical and even more preferably 90% identical at the amino acid level) to at least 10 and preferably 20 consecutive amino acids of the respective molecule for which it is an analog, wherein the homologous region of the derivative shares with the respective parent molecule an ability to induce tolerance to the target antigen.

[0160] It is recognized that tolerogenic regions of an inducing antigen are often different from immunodominant epitopes for the stimulation of an antibody response. Tolerogenic regions are generally regions that can be presented in particular cellular interactions involving T cells. Tolerogenic regions may be present and capable of inducing tolerance upon presentation of the intact antigen. Some antigens contain cryptic tolerogenic regions, in that the processing and presentation of the native antigen does not normally trigger tolerance. An elaboration of cryptic antigens and their identification is found in International Patent Publication WO 94/27634.

[0161] In certain embodiments of this invention, two, three, or a higher plurality of inducing antigens is used. It may be desirable to implement these embodiments when there are a plurality of target antigens, or to provide a plurality of bystanders for the target. For example, both insulin and glucagon can be mixed with a mucosal binding component in the treatment of diabetes. It may also be desirable to provide a cocktail of antigens to cover several possible alternative targets. For example, a cocktail of histocompatibility antigen fragments could be used to tolerize a subject in anticipation of future transplantation with an allograft of unknown phenotype. Allovariant regions of human leukocyte antigens are known in the art: e.g., Immunogenetics 29:231, 1989. In another example, a mixture of allergens may serve as inducing antigen for the treatment of atopy.

[0162] Inducing antigens can be prepared by a number of techniques known in the art, depending on the nature of the molecule. Polynucleotide, polypeptide, and carbohydrate antigens can be isolated from cells of the species to be treated in which they are enriched. Short peptides are conveniently prepared by amino acid synthesis. Longer proteins of known sequence can be prepared by synthesizing an encoding sequence or PCR-amplifying an encoding sequence from a natural source or vector, and then expressing the encoding sequence in a suitable bacterial or eukaryotic host cell.

[0163] In certain embodiments of this invention, the combination comprises a complex mixture of antigens obtained from a cell or tissue, one or more of which plays the role of inducing antigen. The antigens may be in the form of whole cells, either intact or treated with a fixative such as formaldehyde, glutaraldehyde, or alcohol. The antigens may be in the form of a cell lysate, created by detergent solubilization or mechanical rupture of cells or tissue, followed by clarification. The antigens may also be obtained by subcellular fractionation, particularly an enrichment of plasma membrane by techniques such as differential centrifugation, optionally followed by detergent solubilization and dialysis. Other separation techniques are also suitable, such as affinity or ion exchange chromatography of solubilized membrane proteins.

[0164] In one embodiment, the antigenic peptide or protein is an autoantigen, an alloantigen or a transplantation antigen. In yet another particular embodiment, the autoantigen is selected from the group consisting of myelin basic protein, collagen or fragments thereof, DNA, nuclear and nucleolar proteins, mitochondrial proteins and pancreatic β-cell proteins.

[0165] The invention provides for the induction of tolerance to an autoantigen for the treatment of autoimmune diseases by administering the antigen for which tolerance is desired. For example, autoantibodies directed against the myelin basic protein (MBP) are

observed in patients with multiple sclerosis, and, accordingly, MBP antigenic peptides or proteins may be used in the invention to be delivered using the compositions of the present invention to treat and prevent multiple sclerosis.

[0166] By way of another non-limiting example, an individual who is a candidate for a transplant from a non-identical twin may suffer from rejection of the engrafted cells, tissues or organs, as the engrafted antigens are foreign to the recipient. Prior tolerance of the recipient individual to the intended graft abrogates or reduces later rejection. Reduction or elimination of chronic anti-rejection therapies may be achieved by the practice of the present invention. In another example, many autoimmune diseases are characterized by a cellular immune response to an endogenous or self-antigen. Tolerance of the immune system to the endogenous antigen is desirable to control the disease.

[0167] In a further example, sensitization of an individual to an industrial pollutant or chemical, such as may be encountered on-the-job, presents a hazard of an immune response. Prior tolerance of the individual's immune system to the chemical, in particular in the form of the chemical reacted with the individual's endogenous proteins, may be desirable to prevent the later occupational development of an immune response.

[0168] Allergens are other antigens for which tolerance of the immune response thereto is also desirable. In one embodiment, the antigen is a gliaden. In a further embodiment, the antigen is A-gliaden.

[0169] Notably, even in diseases where the pathogenic autoantigen is unknown, bystander suppression may be induced using antigens present in the anatomical vicinity. For example, autoantibodies to collagen are observed in rheumatoid arthritis and, accordingly, a collagen-encoding gene may be utilized as the antigen-expressing gene module in order to treat rheumatoid arthritis (see e.g. Choy (2000) Curr Opin Investig Drugs 1 : 58-62). Furthermore, tolerance to beta cell autoantigens may be utilized to prevent development of type 1 diabetes (see e.g. Bach and Chatenoud (2001) Ann Rev Immunol 19: 131-161).

[0170] As another example, auto-antibodies directed against myelin oligodendrocyte glycoprotein (MOG) are observed in autoimmune encephalomyelitis and in many other CNS diseases as well as multiple sclerosis (see e.g. Iglesias et al. (2001) Glia 36: 22-34). Accordingly, use of MOG antigen expressing constructs in the invention allows for treatment of multiple sclerosis as well as related autoimmune disorders of the central nervous system.

[0171] Still other examples of candidate autoantigens for use in treating autoimmune disease include: pancreatic beta-cell antigens, insulin and GAD to treat insulin-dependent diabetes mellitus; collagen type 11, human cartilage gp 39 (HCgp39) and gpl30-RAPS for use in

treating rheumatoid arthritis; myelin basic protein (MBP), proteo lipid protein (PLP) and myelin oligodendrocyte glycoprotein (MOG, see above) to treat multiple sclerosis; fibrillarin, and small nucleolar protein (snoRNP) to treat scleroderma; thyroid stimulating factor receptor (TSH-R) for use in treating Graves' disease; nuclear antigens, histones, glycoprotein gp70 and ribosomal proteins for use in treating systemic lupus erythematosus; pyruvate dehydrogenase dehydrolipoamide acetyltransferase (PCD-E2) for use in treating primary billiary cirrhosis; hair follicle antigens for use in treating alopecia areata; and human tropomyosin isoform 5 (hTM5) for use in treating ulcerative colitis.

[0172] In one embodiment, the particles of the invention are covalently coupled to antigens comprising one or more epitopes associated with allergies, autoimmune diseases and/or inflammatory diseases or disorders. The antigens may comprise one or more copies of an epitope. In one embodiment, the antigens comprise a single epitope associated with one disease or disorder. In a further embodiment, the antigens comprise more than one epitope associated with the same disease or disorder. In yet a further embodiment, the antigens comprise more than one epitope associated with different diseases or disorders. In a further embodiment, the antigens comprise one or more epitopes associated with one or more allergies. In a further embodiment, the antigens comprise one or more epitopes associated with multiple sclerosis, type 1 diabetes. Celiac's disease, and/or inflammatory bowel disease, including Crohn's disease or ulcerative colitis. In one embodiment, the epitopes are from myelin basic protein (e.g. SEQ ID NOs:4975 & 4976), proteolipid protein (e.g. SEQ ID NO: 4977), myelin oligodendrocyte glycoprotein (e.g. SEQ ID NOs: 1 & 4978), aquaporin, (e.g. SEQ ID NO: 4979), myelin associated glycoprotein (e.g. SEQ ID NO: 4980), insulin (e.g. SEQ ID NO: 4981), glutamic acid decarboxylase (e.g. SEQ ID NO: 4982), gliadin (e.g. SEQ ID NOs:4983-4985 or 5136-5140), the α3 chain of type IV collagen (e.g. SEQ ID NO: 5017), or fragments, homologs, or isoforms thereof. In a further embodiment, the epitopes are from gluten, including from gliadin and/or glutenin. In one embodiment, the epitopes are from insulin homologs, such as those described in U.S. Patent No. 8,476,228 hereby incorporated in its entirety for all purposes. In one embodiment, the gliaden epitopes are SEQ ID NOs: 13, 14, 16, 320, or 321 in U.S. Application No. 20110293644, hereby incorporated in its entirety for all purposes.

[0173] Further non-limiting examples of epitopes associated with various autoimmune diseases and/or inflammatory diseases or disorders that are contemplated by the instant invention are described in Tables 2 and 3.

Table 2 – Representative Linear Epitopes

Disease	Representative Epitopes
Multiple Sclerosis	SEQ ID NOs: 2-1294
Celiac Disease	SEQ ID NOs: 1295-1724; SEQ ID NOs: 1726-1766; SEQ ID NOs: 4986-5140
Diabetes	SEQ ID NOs: 1767-1840; SEQ ID NOs: 1842-1962; SEQ ID NOs: 1964-2027; SEQ ID NOs: 2029-2073; SEQ ID NOs: 2075-2113; SEQ ID NOs: 2115-2197; SEQ ID NOs: 2199-2248; SEQ ID NOs: 2250-2259; SEQ ID NOs: 2261-2420; SEQ ID NOs: 2422-2486; SEQ ID NOs: 2489-2505
Rheumatoid Arthritis	SEQ ID NOs: 2506-3260; SEQ ID NOs:3262-3693
Systemic Lupus Erythematosus	SEQ ID NOs: 3694-3857; SEQ ID NOs: 3860-4565
Good Pasture's Syndrome	SEQ ID NOs: 4566-4576; SEQ ID NOs: 4578-4610; SEQ ID NOs: 4612-4613; SEQ ID NOs: 5018-5039
Autoimmune Uveitis	SEQ ID NOs: 4614-4653
Autoimmune Thyroiditis	SEQ ID NOs: 4654-4694; SEQ ID NOs: 4696-4894; SEQ ID NOs: 4896-4901
Autoimmune Myositis	SEQ ID NOs: 4902-4906
Autoimmune Vasculitis	SEQ ID NOs: 4907-4914
Autoimmune Pancreatitis	SEQ ID NOs: 4915-4917
Crohns Disease	SEQ ID NOs: 4918-4941
Ulcerative Colitis	SEQ ID NOs: 4942-4952
Psoriasis	SEQ ID NOs: 4953-4963
Reactive Arthritis	SEQ ID NOs: 4964-4974

[0174] Not all epitopes are linear epitopes; epitopes can also be discontinuous, conformational epitopes. A number of discontinuous epitopes associated with autoimmune diseases or inflammatory diseases and/or disorders are known. Non-limiting examples of discontinuous epitopes are described in Table 3.

Table 3- Representative Discontinuous Epitopes

Disease	Epitope	Full Length Polypeptide
Celiac Disease	D151, E153, E154, E155, E158;	Protein-glutamine gamma-glutamyltransferase 2

	D306, N308, N310; D434, E435, E437, D438; E329; E153; R19, E153, M659;or C277, H335, D358	SEQ ID NO: 1725
Diabetes	E517; R255, F256, K257, K263, E264, K265, L270, P271, R272, L273, L285, K286, K287, I294, G295, T296, D297, S298, R317, R318; N483, I484, I485, K486, N487, R488, E489, G490, Y491, E492, M493, V494, F495, D496, G497, K498, P499, F556, F557, R558, M559, V560, I561, S562, N563, P564, A565, A566, T567, H568, Q569, D570, I571, D572, F573, L574, I575, E576, E577, I578, E579, R580, L581, G582, Q583, D584, L585; E264; E517, E520, E521, S524, S527, V532; E517, E521; K358; R536, Y540	Glutamate decarboxylase 2 SEQ ID NOs: 1841, 1963, 2114, & 2249
Diabetes	P876, A877, E878, T880; T804; T804, V813, D821, R822, Q862, P886; T804, V813, D821, R822,	protein tyrosine phosphatase, receptor type, N precursor SEQ ID NOs: 2028 & 2074

	Q862, P886; W799, E836, N858; D911; Q862; L831, H833, V834, E836, Q860; W799, E836, N858; W799, L831, H833, V834, Y835, E836, Q860;	
Diabetes	R325, R332, E333, K336, K340; R325; W325	zinc transporter 8 isoform a SEQ ID NO: 2421
Diabetes	E872, C945	Receptor-type tyrosine-protein phosphatase N2 SEQ ID NOs: 2198, 2260, & 2487
Diabetes	W799, C909	tyrosine phosphatase SEQ ID NO: 2488
Rheumatoid Arthritis	L14, M15, I16, S17, R18, N147, G148, S187, M191, H196, N197, H198, Y199, Q201, S203	Chain A, Crystal Structure Of A Human Igm Rheumatoid Factor Fab In Complex With Its Autoantigen Igg Fc SEQ ID NO: 3261
Systemic Lupus Erythematosus	K591, S592, G593	ATP-dependent DNA helicase 2 subunit 1 SEQ ID NO: 3858
Systemic Lupus Erythematosus	M1, K2, L3, V4, R5, F6, L7, M8, K9, L10, S11, H12, E13, T14, V15, T16, I17, E18, L19, K20, N21, G22, T23, Q24, V25, H26, P85, K86, V87, K88, S89, K90, K91, R92, E93, A94, V95,	Small nuclear ribonucleoprotein Sm D1 SEQ ID NO: 3859

	A96, G97, R98, G99, R100, G101, R102, G103, R104, G105, R106, G107, R108, G109, R110, G111, R112, G113, R114, G115, G116, P117, R118, R119	
Systemic Lupus Erythematosus	G59, R62	beta-2-glycoprotein I SEQ ID NO: 4357
Good Pasture's Syndrome	T24, A25, I26, S28, E31, V34, P35, S38, Q64	type IV collagen alpha3 chain SEQ ID NO: 4577
Good Pasture's Syndrome	T1455, A1456, I1457, S1459, E1462, T1464, V1465, P1466, Y1468, S1469, Q1495, T1537, T1565, P1569, H1572, K1579, A1634	alpha3 type IV collagen SEQ ID NO: 4611
Autoimmune Thyroiditis	E604, D620, K627, D630; R225, R646, D707; K627; R225; Y772; K713, F714, P715, E716; P715, D717	Thyroid peroxidase SEQ ID NO: 4695
Autoimmune Thyroiditis	D36, R38, K42, Q55, K58, I60, E61, R80, Y82, S84, T104, H105, E107, R109, N110, K129, F130, D151, F153, I155, E157, T181, K183, D203	Thyrotropin receptor SEQ ID NO: 4895

[0175] Combinations of antigens and/or epitopes can be tested for their ability to promote tolerance by conducting experiments with isolated cells or in animal models.

[0176] In some embodiments, the tolerance inducing compositions of the present invention contain an immune modulating agent, such as rapamycin, tacrolimus,

[0177] In some embodiments, the tolerance inducing compositions of the present invention contain an immune modulating agent such as a Janus Kinase antagonist and/or a Janus Kinase agonist.

[0178] In some embodiments, the tolerance inducing compositions of the present invention contain an immune modulating agent such as a cytokine and/or antibody to a cytokine.

[0179] In some embodiments, the tolerance inducing compositions of the present invention contain growth factors that may promote regulation of T cells. Such factors may include insulin, transforming growth factor beta, serum albumin and any other factor known to support immune cell regulation.

[0180] In some embodiments, the tolerance inducing compositions of the present invention contain antibodies that may promote tolerance induction.

[0181] In some embodiments, the tolerance inducing compositions of the present invention contain an apoptosis signaling molecule (e.g., in addition to an antigenic peptide or other antigenic molecule). In some embodiments, the apoptosis signaling molecule is coupled and/or associated with the surface of the carrier. In some embodiments an apoptotic signaling molecules allows a carrier to be perceived as an apoptotic body by antigen presenting cells of the host, such as cells of the host reticuloendothelial system; this allows presentation of the associated peptide epitopes in a tolerance-inducing manner. Without being bound by theory, this is presumed to prevent the upregulation of molecules involved in immune cell stimulation, such as MHC class I/II, and costimulatory molecules. These apoptosis signaling molecules may also serve as phagocytic markers. For example, apoptosis signaling molecules suitable for the present invention have been described in US Pat App No. 20050113297, which is hereby incorporated by reference in its entirety. Molecules suitable for the present invention include molecules that target phagocytes, which include macrophages, dendritic cells, monocytes, granulocytes and neutrophils.

[0182] In some embodiments, molecules suitable as apoptotic signalling molecules act to enhance tolerance of the associated peptides. Additionally, a carrier bound to an apoptotic signaling molecule can be bound by Clq in apoptotic cell recognition (Paidassi et al., (2008) J. Immunol. 180:2329-2338; herein incorporated by reference in its entirety). For example, molecules that may be useful as apoptotic signalling molecules include phosphatidyl serine, annexin-1, annexin-5, milk fat globule-EGF-factor 8 (MFG-E8), or the family of thrombospondins (e.g., thrombospondin-1 (TSP-1)). Various molecules suitable for use as apoptotic signalling molecules with the present invention are discussed, for example, in U.S. Pat. App. 2012/0076831; herein incorporated by reference in its entirety).

[0183] In some embodiments, the apoptotic signalling molecule may be conjugated to the antigen-specific peptide. In some instances, the apoptotic signalling molecule and antigen-specific peptide are conjugated by the creation of a fusion protein. For example a fusion

protein may comprise at least one antigen-specific peptide (or a fragment or a variant thereof) coupled to at least one molecule of an apoptotic signalling molecule (or a fragment or a variant thereof). For the creation of fusion proteins, the terms "fusion protein," "fusion peptide," "fusion polypeptide," and "chimeric peptide" are used interchangeably. Suitable fragments of the antigen-specific peptide include any fragment of the full-length peptide that retains the function of generating the desired antigen-specific tolerance function of the present invention. The fusion protein may be created by various means understood in the art (e.g., genetic fusion, chemical conjugation, etc.). The two proteins may be fused either directly or via an amino acid linker. The polypeptides forming the fusion protein are typically linked C-terminus to N-terminus, although they can also be linked C-terminus to C-terminus, N-terminus to N-terminus, or N-terminus to C-terminus. The polypeptides of the fusion protein can be in any order. A peptide linker sequence may be employed to separate the first and second polypeptide components by a distance sufficient to ensure that each polypeptide folds into its secondary and tertiary structures. Amino acid sequences which may be usefully employed as linkers include those disclosed in Maratea et. al., Gene 40:39-46 (1985); Murphy et al., Proc. Natl. Acad. Sci. USA 83:8258-8262 (1986); U.S. Pat. No. 4,935,233 and U.S. Pat. No. 4,751,180; herein incorporated by reference in their entireties. The linker sequence may generally be from 1 to about 50 amino acids in length. In some embodiments, linker sequences are not required and/or utilized, for example, when the first and second polypeptides have non-essential N-terminal amino acid regions that can be used to separate the functional domains and prevent steric interference.

[0184] A proxy for tolerogenic activity is the ability of an intact antigen or fragment to stimulate the production of an appropriate cytokine at the target site. The immunoregulatory cytokine released by T suppressor cells at the target site is thought to be TGF-β (Miller et al., Proc. Natl. Acad. Sci. USA 89:421, 1992). Other factors that may be produced during tolerance are the cytokines IL4 and IL-10, and the mediator PGE. In contrast, lymphocytes in tissues undergoing active immune destruction secrete cytokines such as IL-I, IL-2, IL-6, and γ-IFN. Hence, the efficacy of a candidate inducing antigen can be evaluated by measuring its ability to stimulate the appropriate type of cytokines.

[0185] With this in mind, a rapid screening test for tolerogenic epitopes of the inducing antigen, effective mucosal binding components, effective combinations, or effective modes and schedules of mucosal administration can be conducted using syngeneic animals as donors for in vitro cell assays. Animals are treated at a mucosal surface with the test composition, and at some time are challenged with parenteral administration of the target antigen in

complete Freund's adjuvant. Spleen cells are isolated, and cultured in vitro in the presence of the target antigen at a concentration of about 50 μg/mL. Target antigen can be substituted with candidate proteins or sub-fragments to map the location of tolerogenic epitopes. Cytokine secretion into the medium can be quantitated by standard immunoassay.

[0186] The ability of the cells to suppress the activity of other cells can be determined using cells isolated from an animal immunized with the target antigen, or by creating a cell line responsive to the target antigen (Ben-Nun et al., Eur. J. Immunol. 11 :195, 1981, herein incorporated by reference in its entirety). In one variation of this experiment, the suppressor cell population is mildly irradiated (about 1000 to 1250 rads) to prevent proliferation, the suppressors are co-cultured with the responder cells, and then tritiated thymidine incorporation (or MTT) is used to quantitate the proliferative activity of the responders. In another variation, the suppressor cell population and the responder cell population are cultured in the upper and lower levels of a dual chamber transwell culture system (Costar, Cambridge Mass.), which permits the populations to coincubate within 1 mm of each other, separated by a polycarbonate membrane (WO 93/16724). In this approach, irradiation of the suppressor cell population is unnecessary, since the proliferative activity of the responders can be measured separately.

[0187] In embodiments of the invention where the target antigen is already present in the individual, there is no need to isolate the antigen or precombine it with the mucosal binding component. For example, the antigen may be expressed in the individual in a certain fashion as a result of a pathological condition (such as inflammatory bowel disease or Celiac disease) or through digestion of a food allergen. Testing is performed by giving the mucosal binding component in one or more doses or formulations, and determining its ability to promote tolerization against the antigen in situ.

[0188] The effectiveness of compositions and modes of administration for treatment of specific disease can also be elaborated in a corresponding animal disease model. The ability of the treatment to diminish or delay the symptomatology of the disease is monitored at the level of circulating biochemical and immunological hallmarks of the disease, immunohistology of the affected tissue, and gross clinical features as appropriate for the model being employed. Non-limiting examples of animal models that can be used for testing are included in the following section.

[0189] The invention contemplates modulation of tolerance by modulating THl response, TH2 response, TH17 response, or a combination of these responses. Modulating THl response encompasses changing expression of, e.g., interferon-gamma. Modulating TH2

response encompasses changing expression of, e.g., any combination of IL-4, IL-5, IL-10, and IL-13. Typically an increase (decrease) in TH2 response will comprise an increase (decrease) in expression of at least one of IL-4, IL-5, IL-10, or IL-13; more typically an increase (decrease) in TH2 response will comprise an increase in expression of at least two of IL-4, IL-5, IL-10, or EL-13, most typically an increase (decrease) in TH2 response will comprise an increase in at least three of DL-4, IL-5, IL-10, or IL-13, while ideally an increase (decrease) in TH2 response will comprise an increase (decrease) in expression of all of IL-4, IL-5, IL-10, and IL-13. Modulating TH 17 encompasses changing expression of, e.g., TGF-beta, IL-6, IL-21 and IL23, and effects levels of IL-17, IL-21 and IL-22.

[0190] Other suitable methods for assessing the effectiveness of compositions and methods of the present invention are understood in the art, as are discussed, for example, in U.S. Pat. App. 2012/0076831 (herein incorporated by reference in its entirety).

[0191] Certain embodiments of this invention relate to priming of immune tolerance in an individual not previously tolerized by therapeutic intervention. These embodiments generally involve a plurality of administrations of a combination of antigen and mucosal binding component. Typically, at least three administrations, frequently at least four administrations, and sometimes at least six administrations are performed during priming in order to achieve a long-lasting result, although the subject may show manifestations of tolerance early in the course of treatment. Most often, each dose is given as a bolus administration, but sustained formulations capable of mucosal release are also suitable. Where multiple administrations are performed, the time between administrations is generally between 1 day and 3 weeks, and typically between about 3 days and 2 weeks. Generally, the same antigen and mucosal binding component are present at the same concentration, and the administration is given to the same mucosal surface, but variations of any of these variables during a course of treatment may be accommodated.

[0192] Other embodiments of this invention relate to boosting or extending the persistence of a previously established immune tolerance. These embodiments generally involve one administration or a short course of treatment at a time when the established tolerance is declining or at risk of declining. Boosting is generally performed 1 month to 1 year, and typically 2 to 6 months after priming or a previous boost. This invention also includes embodiments that involve regular maintenance of tolerance on a schedule of administrations that occur semiweekly, weekly, biweekly, or on any other regular schedule.

[0193] The particles of the current invention can be given in any dose effective to dampen the inflammatory immune response in a subject in need thereof or to treat a bacterial or viral

infection in a subject in need thereof. In certain embodiments, about 10^2 to about 10^{20} particles are provided to the individual. In a further embodiment between about 10^3 to about 10^{15} particles are provided. In yet a further embodiment between about 10^6 to about 10^{12} particles are provided. In still a further embodiment between about 10^8 to about 10^{10} particles are provided. In a preferred embodiment the preferred dose is 0.1% solids/ml. Therefore, for 0.5 μm beads, a preferred dose is approximately 4 x 10^9 beads, for 0.05μm beads, a preferred dose is approximately 4 x 10^{12} beads, for 3μm beads, a preferred dose is 2 x 10^7 beads. In some embodiments, the particle dose is about 25 mg/mL to about 50 mg/mL. In some embodiments, the particle dose is about 50 mg/mL to about 100 mg/mL. In some embodiments, the particle dose is about 100 mg/mL to about 150 mg/mL. In some embodiments, the particle dose is about 150 mg/mL to about 200 mg/mL. In some embodiments, the particle dose is about 200 mg/mL to about 250 mg/mL. In some embodiments, the particle dose is about 250 mg/mL to about 300 mg/mL. In some embodiments, the particle dose is about 300 mg/mL or more. However, any dose that is effective in treating the particular condition to be treated is encompassed by the current invention.

[0194] The invention is useful for treatment of immune related disorders such as autoimmune disease, transplant rejection, enzyme deficiencies and allergic reactions. Substitution of a synthetic, biocompatible particle system to induce immune tolerance could lead to ease of manufacturing, broad availability of therapeutic agents, increase uniformity between samples, increase the number of potential treatment sites and dramatically reduce the potential for allergic responses to a carrier cell.

[0195] As used herein, the term "immune response" includes T cell mediated and/or B cell mediated immune responses. Exemplary immune responses include T cell responses, e.g., cytokine production and cellular cytotoxicity. In addition, the term immune response includes immune responses that are indirectly effected by T cell activation, e.g., antibody production (humoral responses) and activation of cytokine responsive cells, e.g., macrophages. Immune cells involved in the immune response include lymphocytes, such as B cells and T cells ($CD4^+$, $CD8^+$, Th1 and Th2 cells); antigen presenting cells (e.g., professional antigen presenting cells such as dendritic cells, macrophages, B lymphocytes, Langerhans cells, and nonprofessional antigen presenting cells such as keratinocytes, endothelial cells, astrocytes, fibroblasts, oligodendrocytes); natural killer cells; myeloid cells, such as macrophages, eosinophils, mast cells, basophils, and granulocytes. In some embodiments, the modified

particles of the present invention are effective to reduce inflammatory cell trafficking to the site of inflammation.

[0196] As used herein, the term "anergy," "tolerance," or "antigen-specific tolerance" refers to insensitivity of T cells to T cell receptor-mediated stimulation. Such insensitivity is generally antigen- specific and persists after exposure to the antigenic peptide has ceased. For example, anergy in T cells is characterized by lack of cytokine production, e.g., IL-2. T-cell anergy occurs when T cells are exposed to antigen and receive a first signal (a T cell receptor or CD-3 mediated signal) in the absence of a second signal (a costimulatory signal). Under these conditions, re-exposure of the cells to the same antigen (even if re-exposure occurs in the presence of a costimulatory molecule) results in failure to produce cytokines and subsequently failure to proliferate. Thus, a failure to produce cytokines prevents proliferation. Anergic T cells can, however, proliferate if cultured with cytokines (e.g., IL-2). For example, T cell anergy can also be observed by the lack of IL-2 production by T lymphocytes as measured by ELISA or by a proliferation assay using an indicator cell line. Alternatively, a reporter gene construct can be used. For example, anergic T cells fail to initiate DL-2 gene transcription induced by a heterologous promoter under the control of the 5' IL-2 gene enhancer or by a multimer of the API sequence that can be found within the enhancer (Kang et al. 1992 Science. 257:1134).

[0197] As used herein, the term "immunological tolerance" refers to methods performed on a proportion of treated subjects in comparison with untreated subjects where: a) a decreased level of a specific immunological response (thought to be mediated at least in part by antigen-specific effector T lymphocytes, B lymphocytes, antibody, or their equivalents); b) a delay in the onset or progression of a specific immunological response; or c) a reduced risk of the onset or progression of a specific immunological response. "Specific" immunological tolerance occurs when immunological tolerance is preferentially invoked against certain antigens in comparison with others. “Non-Specific” immunological tolerance occurs when immunological tolerance is invoked indiscriminately against antigens which lead to an inflammatory immune response. “Quasi-Specific” immunological tolerance occurs when immunological tolerance is invoked semi-discriminately against antigens which lead to a pathogenic immune response but not to others which lead to a protective immune response.

[0198] Tolerance to autoantigens and autoimmune disease is achieved by a variety of mechanisms including negative selection of self-reactive T cells in the thymus and mechanisms of peripheral tolerance for those autoreactive T cells that escape thymic deletion and are found in the periphery. Examples of mechanisms that provide peripheral T cell

tolerance include "ignorance" of self-antigens, anergy or unresponsiveness to autoantigen, cytokine immune deviation, and activation-induced cell death of self- reactive T cells. In addition, regulatory T cells have been shown to be involved in mediating peripheral tolerance. See, for example, Walker et al. (2002) Nat. Rev. Immunol. 2: 11-19; Shevach et al. (2001) Immunol. Rev. 182:58-67. In some situations, peripheral tolerance to an autoantigen is lost (or broken) and an autoimmune response ensues. For example, in an animal model for EAE, activation of antigen presenting cells (APCs) through TLR innate immune receptors was shown to break self-tolerance and result in the induction of EAE (Waldner et al. (2004) J. Clin. Invest. 113:990-997).

[0199] Accordingly, in some embodiments, the invention provides methods for increasing antigen presentation while suppressing or reducing TLR7/8, TLR9, and/or TLR 7/8/9 dependent cell stimulation. As described herein, administration of particular modified particles results in antigen presentation by DCs or APCs while suppressing the TLR 7/8, TLR9, and/or TLR7/8/9 dependent cell responses associated with immunostimulatory polynucleotides. Such suppression may include decreased levels of one or more TLR-associated cytokines.

[0200] As discussed above this invention provides novel compounds that have biological properties useful for the treatment of Mac-1 and LFA-1 mediated disorders.

Pharmaceutical Compositions

[0201] Accordingly, in another aspect of the present invention, pharmaceutical compositions are provided, which comprise the tolerizing immune modifying particles and optionally comprise a pharmaceutically acceptable carrier. In certain embodiments, these compositions optionally further comprise one or more additional therapeutic agents. Alternatively, the modified particles of the current invention may be administered to a patient in need thereof in combination with the administration of one or more other therapeutic agents. For example, additional therapeutic agents for conjoint administration or inclusion in a pharmaceutical composition with a compound of this invention may be an approved anti-inflammatory agent, or it may be any one of a number of agents undergoing approval in the Food and Drug Administration that ultimately obtain approval for the treatment of any disorder characterized by an uncontrolled inflammatory immune response or a bacterial or viral infection. It will also be appreciated that certain of the modified particles of present invention can exist in free form for treatment, or where appropriate, as a pharmaceutically acceptable derivative thereof.

[0202] The pharmaceutical compositions of the present invention additionally comprise a pharmaceutically acceptable carrier, which, as used herein, includes any and all solvents, diluents, or other liquid vehicle, dispersion or suspension aids, surface active agents, isotonic agents, thickening or emulsifying agents, preservatives, solid binders, lubricants and the like, as suited to the particular dosage form desired. Remington's Pharmaceutical Sciences, Sixteenth Edition, E. W. Martin (Mack Publishing Co., Easton, Pa., 1980) discloses various carriers used in formulating pharmaceutical compositions and known techniques for the preparation thereof. Except insofar as any conventional carrier medium is incompatible with the compounds of the invention, such as by producing any undesirable biological effect or otherwise interacting in a deleterious manner with any other component(s) of the pharmaceutical composition, its use is contemplated to be within the scope of this invention. Some examples of materials which can serve as pharmaceutically acceptable carriers include, but are not limited to, sugars such as lactose, glucose and sucrose; starches such as corn starch and potato starch; cellulose and its derivatives such as sodium carboxymethyl cellulose, ethyl cellulose and cellulose acetate; powdered tragacanth; malt; gelatine; talc; excipients such as cocoa butter and suppository waxes; oils such as peanut oil, cottonseed oil; safflower oil, sesame oil; olive oil; corn oil and soybean oil; glycols; such as propylene glycol; esters such as ethyl oleate and ethyl laurate; agar; buffering agents such as magnesium hydroxide and aluminum hydroxide; alginic acid; pyrogen free water; isotonic saline; Ringer's solution; ethyl alcohol, and phosphate buffer solutions, as well as other non-toxic compatible lubricants such as sodium lauryl sulfate and magnesium stearate, as well as coloring agents, releasing agents, coating agents, sweetening, flavoring and perfuming agents, preservatives and antioxidants can also be present in the composition, according to the judgment of the formulator.

[0203] Liquid dosage forms for oral administration include, but are not limited to, pharmaceutically acceptable emulsions, microemulsions, solutions, suspensions, syrups and elixirs. In addition to the active compounds, the liquid dosage forms may contain inert diluents commonly used in the art such as, for example, water or other solvents, solubilizing agents and emulsifiers such as ethyl alcohol, isopropyl alcohol, ethyl carbonate, ethyl acetate, benzyl alcohol, benzyl benzoate, propylene glycol, 1,3-butylene glycol, dimethylformamide, oils (in particular, cottonseed, groundnut, corn, germ, olive, castor, and sesame oils), glycerol, tetrahydrofurfuryl alcohol, polyethylene glycols and fatty acid esters of sorbitan, and mixtures thereof. Besides inert diluents, the oral compositions can also include adjuvants

such as wetting agents, emulsifying and suspending agents, sweetening, flavoring, and perfuming agents.

[0204] The particles of the invention may be administered orally, nasally, intravenously, intramuscularly, ocularly, transdermally, intraperitoneally, or subcutaneously. In one embodiment, the particles of the invention are administered intravenously.

Administration

[0205] The effective amounts and method of administration of the present invention for modulation of an immune response can vary based on the individual, what condition is to be treated and other factors evident to one skilled in the art. Factors to be considered include route of administration and the number of doses to be administered. Such factors are known in the art and it is well within the skill of those in the art to make such determinations without undue experimentation. A suitable dosage range is one that provides the desired regulation of immune. Useful dosage ranges of the carrier, given in amounts of carrier delivered, may be, for example, from about any of the following: 0.5 to 10 mg/kg, 1 to 9 mg/kg, 2 to 8 mg/kg, 3 to 7 mg/kg, 4 to 6 mg/kg, 5 mg/kg, 1 to 10 mg/kg, 5 to 10 mg/kg. Alternatively, the dosage can be administered based on the number of particles. For example, useful dosages of the carrier, given in amounts of carrier delivered, may be, for example, about 10^6, 10^7, 10^8, 10^9, 10^{10}, or greater number of particles per dose. The absolute amount given to each patient depends on pharmacological properties such as bioavailability, clearance rate and route of administration. Details of pharmaceutically acceptable carriers, diluents and excipients and methods of preparing pharmaceutical compositions and formulations are provided in Remington's Pharmaceutical Sciences 18th Edition, 1990, Mack Publishing Co., Easton, Pa., USA., which is hereby incorporated by reference in its entirety.

[0206] The effective amount and method of administration of the particular carrier formulation can vary based on the individual patient, desired result and/or type of disorder, the stage of the disease and other factors evident to one skilled in the art. The route(s) of administration useful in a particular application are apparent to one of skill in the art. Routes of administration include but are not limited to topical, dermal, transdermal, transmucosal, epidermal, parenteral, gastrointestinal, and naso-pharyngeal and pulmonary, including transbronchial and transalveolar. A suitable dosage range is one that provides sufficient IRP-containing composition to attain a tissue concentration of about 1-50 μM as measured by blood levels. The absolute amount given to each patient depends on pharmacological properties such as bioavailability, clearance rate and route of administration.

[0207] The present invention provides carrier formulations suitable for topical application including, but not limited to, physiologically acceptable implants, ointments, creams, rinses and gels. Exemplary routes of dermal administration are those which are least invasive such as transdermal transmission, epidermal administration and subcutaneous injection.

[0208] Transdermal administration is accomplished by application of a cream, rinse, gel, etc. capable of allowing the carrier to penetrate the skin and enter the blood stream. Compositions suitable for transdermal administration include, but are not limited to, pharmaceutically acceptable suspensions, oils, creams and ointments applied directly to the skin or incorporated into a protective carrier such as a transdermal device (so-called "patch"). Examples of suitable creams, ointments etc. can be found, for instance, in the Physician's Desk Reference. Transdermal transmission may also be accomplished by iontophoresis, for example using commercially available patches which deliver their product continuously through unbroken skin for periods of several days or more. Use of this method allows for controlled transmission of pharmaceutical compositions in relatively great concentrations, permits infusion of combination drugs and allows for contemporaneous use of an absorption promoter.

[0209] Parenteral routes of administration include but are not limited to electrical (iontophoresis) or direct injection such as direct injection into a central venous line, intravenous, intramuscular, intraperitoneal, intradermal, or subcutaneous injection. Formulations of carrier suitable for parenteral administration are generally formulated in USP water or water for injection and may further comprise pH buffers, salts bulking agents, preservatives, and other pharmaceutically acceptable excipients. Immunoregulatory polynucleotide for parenteral injection may be formulated in pharmaceutically acceptable sterile isotonic solutions such as saline and phosphate buffered saline for injection.

[0210] Gastrointestinal routes of administration include, but are not limited to, ingestion and rectal routes and can include the use of, for example, pharmaceutically acceptable powders, pills or liquids for ingestion and suppositories for rectal administration.

[0211] Naso-pharyngeal and pulmonary administration include are accomplished by inhalation, and include delivery routes such as intranasal, transbronchial and transalveolar routes. The invention includes formulations of carrier suitable for administration by inhalation including, but not limited to, liquid suspensions for forming aerosols as well as powder forms for dry powder inhalation delivery systems. Devices suitable for administration by inhalation of carrier formulations include, but are not limited to, atomizers, vaporizers, nebulizers, and dry powder inhalation delivery devices.

[0212] Injectable preparations, for example, sterile injectable aqueous or oleaginous suspensions may be formulated according to the known art using suitable dispersing or wetting agents and suspending agents. The sterile injectable preparation may also be a sterile injectable solution, suspension or emulsion in a nontoxic parenterally acceptable diluent or solvent, for example, as a solution in 1,3-butanediol. Among the acceptable vehicles and solvents that may be employed are water, Ringer's solution, U.S.P. and isotonic sodium chloride solution. In addition, sterile, fixed oils are conventionally employed as a solvent or suspending medium. For this purpose any bland fixed oil can be employed including synthetic mono-or diglycerides. In addition, fatty acids such as oleic acid are used in the preparation of injectables.

[0213] The injectable formulations can be sterilized, for example, by filtration through a bacterial-retaining filter, or by incorporating sterilizing agents in the form of sterile solid compositions which can be dissolved or dispersed in sterile water or other sterile injectable medium prior to use.

[0214] In order to prolong the effect of a drug, it is often desirable to slow the absorption of the drug from subcutaneous or intramuscular injection. This may be accomplished by the use of a liquid suspension or crystalline or amorphous material with poor water solubility. The rate of absorption of the drug then depends upon its rate of dissolution that, in turn, may depend upon crystal size and crystalline form. Alternatively, delayed absorption of a parenterally administered drug form is accomplished by dissolving or suspending the drug in an oil vehicle. Injectable depot forms are made by forming microencapsule matrices of the drug in biodegradable polymers such as polylactide-polyglycolide. Depending upon the ratio of drug to polymer and the nature of the particular polymer employed, the rate of drug release can be controlled. Examples of other biodegradable polymers include (poly(orthoesters) and poly(anhydrides). Depot injectable formulations are also prepared by entrapping the drug in liposomes or microemulsions which are compatible with body tissues.

[0215] In some embodiments, the synthetic, biodegradable particles of the present invention provide ease of manufacturing, broad availability of therapeutic agents, and increased treatment sites. Experiments conducted during development of embodiments of the present invention demonstrated the conjugation of peptides (e.g., $PLP_{139-151}$ peptide) to these particles. Such peptide-coupled particles have shown that they are effective for the prevention of disease development and the induction of immunological tolerance (e.g., in the SJL/J $PLP_{139-151}$ /CFA-induced R-EAE murine model of multiple sclerosis). Peptide coupled carriers of the present invention provide numerous advantages over other tolerance induction

structures. In some embodiments, the particles are biodegradable, and therefore will not persist for long times in the body. The time for complete degradation can be controlled. In some embodiments, particles are functionalized to facilitate internalization without cell activation (e.g., phosphatidylserine loaded into PLG microspheres). In some embodiments, particles incorporate targeting ligands for a specific cell population. In some embodiments, anti-inflammatory cytokines such as IL-10 and TGF-β, are included on or within particles to limit activation of the cell type that is internalizing the particles and to facilitate the induction of tolerance via energy and/or deletion and the activation of regulatory T cells. The composition of the particles has been found to affect the length of time the particles persist in the body and tolerance requires rapid particle uptake and clearance/degradation. Since ratios of over 50:50 lactide:glycolide slow the degradation rate, the particles of the invention have a lactide:glycolide ratio of about 50:50 or below. In one embodiment the particles of the invention have about a 50:50 D,L-lactide:glycolide ratio.

[0216] Solid dosage forms for oral administration include capsules, tablets, pills, powders, and granules. In such solid dosage forms, the modified particles are mixed with at least one inert, pharmaceutically acceptable excipient or carrier such as sodium citrate or dicalcium phosphate and/or a) fillers or extenders such as starches, lactose, sucrose, glucose, mannitol, and silicic acid, b) binders such as, for example, carboxymethylcellulose, alginates, gelatin, polyvinylpyrrolidinone, sucrose, and acacia, c) humectants such as glycerol, d) disintegrating agents such as agar-agar, calcium carbonate, potato or tapioca starch, alginic acid, certain silicates, and sodium carbonate, e) solution retarding agents such as paraffin, f) absorption accelerators such as quaternary ammonium compounds, g) wetting agents such as, for example, cetyl alcohol and glycerol monostearate, h) absorbents such as kaolin and bentonite clay, and i) lubricants such as talc, calcium stearate, magnesium stearate, solid polyethylene glycols, sodium lauryl sulfate, and mixtures thereof. In the case of capsules, tablets and pills, the dosage form may also comprise buffering agents.

[0217] Solid compositions of a similar type may also be employed as fillers in soft and hard-filled gelatin capsules using such excipients as lactose or milk sugar as well as high molecular weight polyethylene glycols and the like. The solid dosage forms of tablets, dragees, capsules, pills, and granules can be prepared with coatings and shells such as enteric coatings and other coatings well known in the pharmaceutical formulating art. They may optionally contain opacifying agents and can also be of a composition that they release the active ingredient(s) only, or preferentially, in a certain part of the intestinal tract, optionally, in a delayed manner. Examples of embedding compositions that can be used include

polymeric substances and waxes. Solid compositions of a similar type may also be employed as fillers in soft and hard-filled gelatin capsules using such excipients as lactose or milk sugar as well as high molecular weight polyethylene glycols and the like.

[0218] The modified particles can also be in micro-encapsulated form with one or more excipients as noted above. The solid dosage forms of tablets, dragees, capsules, pills, and granules can be prepared with coatings and shells such as enteric coatings, release controlling coatings and other coatings well known in the pharmaceutical formulating art. In such solid dosage forms the active compound may be admixed with at least one inert diluent such as sucrose, lactose and starch. Such dosage forms may also comprise, as in normal practice, additional substances other than inert diluents, e.g., tableting lubricants and other tableting aids such as magnesium stearate and microcrystalline cellulose. In the case of capsules, tablets and pills, the dosage forms may also comprise buffering agents. They may optionally contain opacifying agents and can also be of a composition that they release the modified particles only, or preferentially, in a certain part of the intestinal tract, optionally, in a delayed manner. Examples of embedding compositions which can be used include polymeric substances and waxes.

[0219] The present invention encompasses pharmaceutically acceptable topical formulations of the inventive modified particles. The term "pharmaceutically acceptable topical formulation", as used herein, means any formulation which is pharmaceutically acceptable for intradermal administration of modified microparticles of the invention by application of the formulation to the epidermis. In certain embodiments of the invention, the topical formulation comprises a carrier system. Pharmaceutically effective carriers include, but are not limited to, solvents (e.g., alcohols, poly alcohols, water), creams, lotions, ointments, oils, plasters, liposomes, powders, emulsions, microemulsions, and buffered solutions (e.g., hypotonic or buffered saline) or any other carrier known in the art for topically administering pharmaceuticals. A more complete listing of art-known carriers is provided by reference texts that are standard in the art, for example, Remington's Pharmaceutical Sciences, 16th Edition, 1980 and 17th Edition, 1985, both published by Mack Publishing Company, Easton, Pa., the disclosures of which are incorporated herein by reference in their entireties. In certain other embodiments, the topical formulations of the invention may comprise excipients. Any pharmaceutically acceptable excipient known in the art may be used to prepare the inventive pharmaceutically acceptable topical formulations. Examples of excipients that can be included in the topical formulations of the invention include, but are not limited to, preservatives, antioxidants, moisturizers, emollients, buffering agents, solubilizing agents,

other penetration agents, skin protectants, surfactants, and propellants, and/or additional therapeutic agents used in combination to the modified particles. Suitable preservatives include, but are not limited to, alcohols, quaternary amines, organic acids, parabens, and phenols. Suitable antioxidants include, but are not limited to, ascorbic acid and its esters, sodium bisulfite, butylated hydroxytoluene, butylated hydroxyanisole, tocopherols, and chelating agents like EDTA and citric acid. Suitable moisturizers include, but are not limited to, glycerine, sorbitol, polyethylene glycols, urea, and propylene glycol. Suitable buffering agents for use with the invention include, but are not limited to, citric, hydrochloric, and lactic acid buffers. Suitable solubilizing agents include, but are not limited to, quaternary ammonium chlorides, cyclodextrins, benzyl benzoate, lecithin, and polysorbates. Suitable skin protectants that can be used in the topical formulations of the invention include, but are not limited to, vitamin E oil, allantoin, dimethicone, glycerin, petrolatum, and zinc oxide.

[0220] In certain embodiments, the pharmaceutically acceptable topical formulations of the invention comprise at least the modified particles of the invention and a penetration enhancing agent. The choice of topical formulation will depend or several factors, including the condition to be treated, the physicochemical characteristics of the inventive compound and other excipients present, their stability in the formulation, available manufacturing equipment, and costs constraints. As used herein the term "penetration enhancing agent" means an agent capable of transporting a pharmacologically active compound through the stratum corneum and into the epidermis or dermis, preferably, with little or no systemic absorption. A wide variety of compounds have been evaluated as to their effectiveness in enhancing the rate of penetration of drugs through the skin. See, for example, Percutaneous Penetration Enhancers, Maibach H. I. and Smith H. E. (eds.), CRC Press, Inc., Boca Raton, Fla. (1995), which surveys the use and testing of various skin penetration enhancers, and Buyuktimkin et al., Chemical Means of Transdermal Drug Permeation Enhancement in Transdermal and Topical Drug Delivery Systems, Gosh T. K., Pfister W. R., Yum S. I. (Eds.), Interpharm Press Inc., Buffalo Grove, Ill. (1997). In certain exemplary embodiments, penetration agents for use with the invention include, but are not limited to, triglycerides (e.g., soybean oil), aloe compositions (e.g., aloe-vera gel), ethyl alcohol, isopropyl alcohol, octolyphenylpolyethylene glycol, oleic acid, polyethylene glycol 400, propylene glycol, N-decylmethylsulfoxide, fatty acid esters (e.g., isopropyl myristate, methyl laurate, glycerol monooleate, and propylene glycol monooleate) and N-methylpyrrolidone.

[0221] In certain embodiments, the compositions may be in the form of ointments, pastes, creams, lotions, gels, powders, solutions, sprays, inhalants or patches. In certain exemplary

embodiments, formulations of the compositions according to the invention are creams, which may further contain saturated or unsaturated fatty acids such as stearic acid, palmitic acid, oleic acid, palmito-oleic acid, cetyl or oleyl alcohols, stearic acid being particularly preferred. Creams of the invention may also contain a non-ionic surfactant, for example, polyoxy-40-stearate. In certain embodiments, the active component is admixed under sterile conditions with a pharmaceutically acceptable carrier and any needed preservatives or buffers as may be required. Ophthalmic formulation, eardrops, and eye drops are also contemplated as being within the scope of this invention. Additionally, the present invention contemplates the use of transdermal patches, which have the added advantage of providing controlled delivery of a compound to the body. Such dosage forms are made by dissolving or dispensing the compound in the proper medium. As discussed above, penetration enhancing agents can also be used to increase the flux of the compound across the skin. The rate can be controlled by either providing a rate controlling membrane or by dispersing the compound in a polymer matrix or gel.

[0222] The modified particles can be administered by aerosol. This is accomplished by preparing an aqueous aerosol, liposomal preparation or solid particles containing the modified particles. A nonaqueous (e.g., fluorocarbon propellant) suspension could be used.

[0223] Ordinarily, an aqueous aerosol is made by formulating an aqueous solution or suspension of the agent together with conventional pharmaceutically acceptable carriers and stabilizers. The carriers and stabilizers vary with the requirements of the particular compound, but typically include nonionic surfactants (Tweens, PLURONIC®, or polyethylene glycol), innocuous proteins like serum albumin, sorbitan esters, oleic acid, lecithin, amino acids such as glycine, buffers, salts, sugars or sugar alcohols. Aerosols generally are prepared from isotonic solutions.

[0224] It will also be appreciated that the modified particles and pharmaceutical compositions of the present invention can be formulated and employed in combination therapies, that is, the compounds and pharmaceutical compositions can be formulated with or administered concurrently with, prior to, or subsequent to, one or more other desired therapeutics or medical procedures. The particular combination of therapies (therapeutics or procedures) to employ in a combination regimen will take into account compatibility of the desired therapeutics and/or procedures and the desired therapeutic effect to be achieved. It will also be appreciated that the therapies employed may achieve a desired effect for the same disorder (for example, an inventive compound may be administered concurrently with

another anti-inflammatory agent), or they may achieve different effects (e.g., control of any adverse effects).

[0225] In certain embodiments, the pharmaceutical compositions containing the modified particles of the present invention further comprise one or more additional therapeutically active ingredients (e.g., anti-inflammatory and/or palliative). For purposes of the invention, the term "Palliative" refers to treatment that is focused on the relief of symptoms of a disease and/or side effects of a therapeutic regimen, but is not curative. For example, palliative treatment encompasses painkillers, antinausea medications and anti-sickness drugs.

[0226] The invention provides methods of regulating an immune response in an individual, preferably a mammal, more preferably a human, comprising administering to the individual the modified particles described herein. Methods of immunoregulation provided by the invention include those that suppress and/or inhibit an innate immune response or an adaptive immune response, including, but not limited to, an immune response stimulated by immunostimulatory polypeptides or viral or bacterial components.

[0227] The modified particles are administered in an amount sufficient to regulate an immune response. As described herein, regulation of an immune response may be humoral and/or cellular, and is measured using standard techniques in the art and as described herein.

[0228] In some embodiments, compositions described herein are administered along with (e.g., concurrent with, prior to, or following) an implant (e.g., device) and/or transplant (e.g., tissue, cells, organ) to mediate, negate, regulate and/or reduce the immune response associated therewith.

Indications

[0229] In certain embodiments, the individual suffers from a disorder associated with unwanted immune activation, such as allergic disease or condition, allergy and asthma. An individual having an allergic disease or asthma is an individual with a recognizable symptom of an existing allergic disease or asthma. Tolerance can be induced in such an individual, for example, by particles complexed with the specific foods (e.g. peanut proteins, etc.), injected substances (e.g. bee venom proteins, etc.), or inhaled substances (e.g. ragweed pollen proteins, pet dander proteins, etc.) which elicit the allergic reaction.

[0230] In certain embodiments, the individual suffers from a disorder associated with unwanted immune activation, such as autoimmune disease and inflammatory disease. An individual having an autoimmune disease or inflammatory disease is an individual with a recognizable symptom of an existing autoimmune disease or inflammatory disease.

Tolerance can be induced in such an individual, for example, by particles complexed with the relevant autoantigens driving the particular autoimmune disease.

[0231] In certain embodiments, the individual suffers from a disorder associated with enzyme replacement therapy. Tolerance can be induced in such an individual, for example, by particles covalently coupled with the enzymes which patients with genetic deficiencies fail to produce, to prevent them from making neutralizing antibody responses to recombinantly-produced enzymes administered to treat their particular deficiency, e.g. tolerance to human Factor VIII in patients with hemophilia due to a genetic deficiency in the ability to make Factor VIII. Another example may include enzyme replacement in for conditions such as mucopolysaccharide storage disorder, gangliosidosis, alkaline hypophosphatasia, cholesterol ester storage disease, hyperuricemia, growth hormone deficiency, renal anemia or with lysomal storage disorders including Fabry's disease, Gaucher's disease, Hurler's disease, Hunter's syndrome, Maroteaux-Lamy disease, Niemann-Pick disease, Tay-Sachs disease, and Pompe disease.

[0232] In certain embodiments, the individual suffers from a robust, or otherwise adverse, immune response towards an agent administered for the treatment of a disease that actually or potentially compromises patient health or treatment. Additionally, novel compounds provided by this invention may be provided to individuals who do not show an immune response to an agent but may potentially do so in the future. In certain embodiments, the individual is receiving enzyme replacement therapy. In certain embodiments, therapeutic agents include, but are not limited to, peptides or protein-based agents, DNA vaccines, siRNA, splice-site switching oligomers, and RNA-based nanoparticles. In some embodiments, the therapeutic agents include, but are not limited to, Advate, antihemophilic factor, Kogenate, Eloctate, recombinant factor VIII Fc fusion protein, Refacto, Novo VIIa, recombinant factor VII, eptacog alfa, Helixate, Monanine, Coagulation Factor IX, Wilate, Ceredase, Alglucerase, Cerezyme, Imiglucerase, Elelso, taliglucerase alfa, Fabrazyme, Agalsidase beta, Aldurazyme, -I-iduronidase, Myozyme, Acid-glucosidase, Elaprase, iduronate-2-sulfatase, Naglazyme arylsufatase B, and N-acetylgalactosamin e-4-sulfatase. In some embodiments, the individual is administered therapeutic agents administered to treat diseases including, but not limited to, Hemophilia, Hemophilia A, Hemophilia B, von Willebrand disease, Gaucher's Disease, Fabry's Disease, Hurler's Disease, Pompe's Disease, Hunter's Disease, mucopolysaccharide storage disorder, gangliosidosis, alkaline hypophosphatasia, cholesterol ester storage disease, hyperuricemia, growth hormone deficiency, renal anemia and Maroteaux-Lary Disease.

[0233] In certain embodiments, the individual suffers from an orphan autoimmune condition. Such conditions include, but are not limited to, idiopathic thrombocytopenic purpura, membranous nephropathy, bullous pemphigoid, pemphigus vulgaris, and Myasthenia Gravis.

[0234] In certain embodiments, the individual suffers from a disorder associated with disease therapy. In the case of recombinant antibodies, tolerance is induced for example, to a humanized antibody being employed in a therapeutic context to prevent a patient from making neutralizing antibodies against the antibody therapeutic, e.g. tolerance to a humanized immune subset depleting antibody or anti-cytokine antibody being used as a treatment for autoimmune disease.

[0235] Autoimmune diseases can be divided in two broad categories: organ-specific and systemic. Autoimmune diseases include, without limitation, rheumatoid arthritis (RA), systemic lupus erythematosus (SLE), type I diabetes mellitus, type II diabetes mellitus, multiple sclerosis (MS), immune- mediated infertility such as premature ovarian failure, scleroderma, Sjogren's disease, vitiligo, alopecia (baldness), polyglandular failure, Grave's disease, hypothyroidism, polymyositis, pemphigus vulgaris, pemphigus foliaceus, inflammatory bowel disease including Crohn's disease and ulcerative colitis, autoimmune hepatitis including that associated with hepatitis B virus (HBV) and hepatitis C virus (HCV), hypopituitarism, graft-versus-host disease (GvHD), myocarditis, Addison's disease, autoimmune skin diseases, uveitis, pernicious anemia, Celiac disease, hypoparathyroidism neuomyelitis optica, membraneous nephropathy, bullous pemphigoid, pemphigus vulgaris, myasthenia gravis .

[0236] Autoimmune diseases may also include, without limitation, Hashimoto's thyroiditis, Type I and Type II autoimmune polyglandular syndromes, paraneoplastic pemphigus, bullus pemphigoid, dermatitis herpetiformis, linear IgA disease, epidermolysis bullosa acquisita, erythema nodosa, pemphigoid gestationis, cicatricial pemphigoid, mixed essential cryoglobulinemia, chronic bullous disease of childhood, hemolytic anemia, thrombocytopenic purpura, Goodpasture's syndrome, autoimmune neutropenia, myasthenia gravis, Eaton-Lambert myasthenic syndrome, stiff-man syndrome, acute disseminated encephalomyelitis, Guillain-Barre syndrome, chronic inflammatory demyelinating polyradiculoneuropathy, multifocal motor neuropathy with conduction block, chronic neuropathy with monoclonal gammopathy, opsonoclonus-myoclonus syndrome, cerebellar degeneration, encephalomyelitis, retinopathy, primary biliary sclerosis, sclerosing cholangitis, gluten-sensitive enteropathy, ankylosing spondylitis, reactive arthritides, polymyositis/dermatomyositis, mixed connective tissue disease, Bechet's syndrome,

psoriasis, polyarteritis nodosa, allergic anguitis and granulomatosis (Churg-Strauss disease), polyangiitis overlap syndrome, hypersensitivity vasculitis, Wegener's granulomatosis, temporal arteritis, Takayasu's arteritis, Kawasaki's disease, isolated vasculitis of the central nervous system, thromboangiutis obliterans, sarcoidosis, glomerulonephritis, and cryopathies. These conditions are well known in the medical arts and are described, for example, in Harrison's Principles of Internal Medicine, 14th ed., Fauci A S et al., eds., New York: McGraw-Hill, 1998.

[0237] Animal models for the study of autoimmune disease are known in the art. For example, animal models which appear most similar to human autoimmune disease include animal strains which spontaneously develop a high incidence of the particular disease. Examples of such models include, but are not limited to, the nonobese diabetic (NOD) mouse, which develops a disease similar to type 1 diabetes, and lupus-like disease prone animals, such as New Zealand hybrid, MRL-Fas^{lpr} and BXSB mice. Animal models in which an autoimmune disease has been induced include, but are not limited to, experimental autoimmune encephalomyelitis (EAE), which is a model for multiple sclerosis, collagen-induced arthritis (CIA), which is a model for rheumatoid arthritis, Desmoglein 3 transgenic T cell mouse, which can be used as an experimental model of Pemphigus Vulgaris and experimental autoimmune uveitis (EAU), which is a model for uveitis. Animal models for autoimmune disease have also been created by genetic manipulation and include, for example, IL-2/IL-10 knockout mice for inflammatory bowel disease, Fas or Fas ligand knockout for SLE, and IL-I receptor antagonist knockout for rheumatoid arthritis.

[0238] In certain embodiments, the individual suffers from a bacterial or viral infection. An individual having a bacterial or viral infection is an individual with a recognizable symptom of an existing bacterial or viral infection.

[0239] A non-limiting list of viral infections treatable with the modified particles of the current invention includes herpes virus infections, hepatitis virus infections, west nile virus infections, flavivirus infections, influenza virus infections, rhinovirus infections, papillomavirus infections, paromyxovirus infections, parainfluenza virus infections, and retrovirus infections. Preferred viruses are those viruses that infect the central nervous system of the subject. Most preferred viruses are those that cause hemorrgic fever, encephalitis or meningitis.

[0240] A non-limiting list of bacterial infections treatable with the modified particles of the current invention include staphlococcus infections, streptococcus infections, mycobacterial infections, bacillus infections, Salmonella infections, Vibrio infections, spirochete infections,

and Neisseria infections. Preferred are bacteria that infect the central nervous system of the subject. Most preferred are bacteria that cause encephalitis or meningitis.

[0241] In some embodiments, the invention relates to uses of compositions of this invention prior to the onset of disease. In other embodiments, the invention relates to uses of the compositions of this invention to inhibit ongoing disease. In some embodiments, the invention relates to ameliorating disease in a subject. By ameliorating disease in a subject is meant to include treating, preventing or suppressing the disease in the subject.

[0242] In some embodiments, the invention relates to preventing the relapse of disease. For example, an unwanted immune response can occur at one region of a peptide (such as an antigenic determinant). Relapse of a disease associated with an unwanted immune response can occur by having an immune response attack at a different region of the peptide. Since the immune modifying particles of the current invention are free from attached peptides or antigenic moieties, the particles will be effective against multiple epitopes. T-cell responses in some immune response disorders, including MS and other ThI /17-mediated autoimmune diseases, can be dynamic and evolve during the course of relapsing-remitting and/or chronic-progressive disease. The dynamic nature of the T- cell repertoire has implications for treatment of certain diseases, since the target may change as the disease progresses. Previously, pre-existing knowledge of the pattern of responses was necessary to predict the progression of disease. The present invention provides compositions that can prevent the effect of dynamic changing disease, a function of "epitope spreading." A known model for relapse is an immune reaction to proteolipid protein (PLP) as a model for multiple sclerosis (MS). Initial immune response can occur by a response to $PLP_{139-151}$. Subsequent disease onset can occur by a relapse immune response to PLP[pi]s-iβi.

[0243] Other embodiments of this invention relate to transplantation. This refers to the transfer of a tissue sample or graft from a donor individual to a recipient individual, and is frequently performed on human recipients who need the tissue in order to restore a physiological function provided by the tissue. Tissues that are transplanted include (but are not limited to) whole organs such as kidney, liver, heart, lung; organ components such as skin grafts and the cornea of the eye; and cell suspensions such as bone marrow cells and cultures of cells selected and expanded from bone marrow or circulating blood, and whole blood transfusions.

[0244] A serious potential complication of any transplantation ensues from antigenic differences between the host recipient and the engrafted tissue. Depending on the nature and degree of the difference, there may be a risk of an immunological assault of the graft by the

host, or of the host by the graft, or both, may occur. The extent of the risk is determined by following the response pattern in a population of similarly treated subjects with a similar phenotype, and correlating the various possible contributing factors according to well accepted clinical procedures. The immunological assault may be the result of a preexisting immunological response (such as preformed antibody), or one that is initiated about the time of transplantation (such as the generation of Th cells). Antibody, Th cells, or Tc cells may be involved in any combination with each other and with various effector molecules and cells. However, the antigens which are involved in the immune response are generally not known, therefore posing difficulties in designing antigen-specific therapies or inducing antigen-specific tolerance.

[0245] Certain embodiments of the invention relate to decreasing the risk of host versus graft disease, leading to rejection of the tissue graft by the recipient. The treatment may be performed to prevent or reduce the effect of a hyperacute, acute, or chronic rejection response. Treatment is preferentially initiated sufficiently far in advance of the transplant so that tolerance will be in place when the graft is installed; but where this is not possible, treatment can be initiated simultaneously with or following the transplant. Regardless of the time of initiation, treatment will generally continue at regular intervals for at least the first month following transplant. Follow-up doses may not be required if a sufficient accommodation of the graft occurs, but can be resumed if there is any evidence of rejection or inflammation of the graft. Of course, the tolerization procedures of this invention may be combined with other forms of immunosuppression to achieve an even lower level of risk.

[0246] Certain embodiments of the invention relate to decreasing or otherwise ameliorating the inflammatory response induced as a response to surgery. In one embodiment of the invention, the immune-modifying particles are administered before surgery. In a further embodiment of the invention, the immune-modifying particles are administered concurrently with or during surgery. In yet a further embodiment of the invention, the immune-modifying particles are administered after surgery.

[0247] The particles of the invention may also be used to treat abscesses or empyemas to decrease the inflammatory response produced in the subject after exposure to infectious agents such as bacteria or parasites. In one embodiment of the invention, the immune-modifying particles are administered in conjunction with anti-bacterial and/or anti-parasitic treatments known in the art.

[0248] The particles of the invention may also be used to decrease or otherwise ameliorate the inflammatory response induced as a response to physical trauma or injury including, but

not limited to, a sports injury, a wound, a spinal cord injury, a brain injury, and/or a soft tissue injury. In one embodiment of the invention, the immune-modifying particles are administered after the subject experiences trauma or injury.

[0249] The particles of the invention may also be used to decrease the inflammatory response associated with the development and/or growth of cancer cells. Cancers that can be treated include, but are not limited to, central nervous system cancer, basal cell carcinoma, cancerous brain tumors, Burkitt's lymphoma, lymphoma, cervical cancer, ovarian cancer, testicular cancer, liver cancer, non-small cell and small cell lung cancers, melanoma, bladder cancer, breast cancer, colon and rectal cancers, endometrial cancer, kidney (renal cell) cancer, leukemia, Non-Hodgkin lymphoma, pancreatic cancer, prostate cancer, melanoma, and thyroid cancer. In one embodiment, the subcutaneous injection of the particles of the invention prevents the accumulation of inhibitory neutrophils, thereby decreasing inflammation in the cancer patient.

[0250] The particles of the invention are also useful for the regeneration of damaged tissue. In one embodiment, administration of the particles to a patient increases the regeneration of damaged epithelial cells in the digestive tract. In a further embodiment, the patient suffers from colitis, Crohn's disease, or inflammatory bowel disease. In another embodiment, administration of the particles of the invention to a patient increases remyelination of neurons. In a further embodiment, the patient suffers from multiple sclerosis.

Scaffolds, Matrices, and Delivery Systems

[0251] In some embodiments, compositions of the present invention (e.g., PLG carrier polymer covalently coupled to antigenic molecule) find use with one or more scaffolds, matrices, and/or delivery systems (See, e.g., U.S. Pat. App. 2009/0238879; U.S. Pat. No. 7,846,466; U.S. Pat. No. 7,427,602; U.S. Pat. No. 7,029,697; U.S. Pat. No. 6,890,556; U.S. Pat. No.6,797,738; U.S. Pat. No. 6,281,256; herein incorporated by reference in their entireties). In some embodiments, particles (e.g., antigen-coupled PLG particles) are associated with, adsorbed on, embedded within, conjugated to, etc. a scaffold, matrix, and/or delivery system (e.g., for delivery of chemical/biological material, cells, tissue, and/or an organ to a subject). In some embodiments, a scaffold, matrix, and/or delivery system (e.g., for delivery of chemical/biological material, cells, tissue, and/or an organ to a subject) comprises and/or is made from materials described herein (e.g., PLG conjugated to one or more antigenic peptides).

[0252] In some embodiments, microporous scaffolds (e.g., for transplanting biological material (e.g., cells, tissue, etc.) into a subject) are provided. In some embodiments, microporous scaffolds are provided having thereon agents (e.g., extracellular matrix proteins, exendin-4) and biological material (e.g., pancreatic islet cells). In some embodiments, the scaffolds are used in the treatment of diseases (e.g., type 1 diabetes), and related methods (e.g., diagnostic methods, research methods, drug screening). In some embodiments, scaffolds are provided with the antigen-conjugated carriers described herein on and/or within the scaffold. In some embodiments, scaffolds are produced from antigen conjugated materials (e.g., antigen conjugated PLG).

[0253] In some embodiments, a scaffold and/or delivery system comprises one or more layers and/or has one or more chemical and/or biological entities/agents (e.g., proteins, peptide-conjugated particles, small molecules, cells, tissue, etc.), see, e.g., U.S. Pat. App. 2009/0238879; herein incorporated by reference in its entirety. In some embodiments, antigen-coupled particles are co-administered with a scaffold delivery system to elicit induction of immunological tolerance to the scaffold and the associated materials. In some embodiments, microporous scaffold is administered to a subject with particles described herein on or within the scaffold. In some embodiments, antigen-coupled particles coupled to a scaffold delivery system. In some embodiments, a scaffold delivery system comprises antigen-coupled particles.

[0254] Various modification, recombination, and variation of the described features and embodiments will be apparent to those skilled in the art without departing from the scope and spirit of the invention. Although specific embodiments have been described, it should be understood that the invention as claimed should not be unduly limited to such specific embodiments. Indeed, various modifications of the described modes and embodiments that are obvious to those skilled in the relevant fields are intended to be within the scope of the following claims. For example, U.S. Pat. Applications 2012/0076831, 2002/0045672, 2005/0090008, 2006/0002978, and 2009/0238879 (each of which is herein incorporated by reference in their entirety) and U.S. Pat. Nos. 7,846,466; 7,427,602; 7,029,697; 6,890,556; 6,797,738; and 6,281,256 (each of which is herein incorporated by reference in their entirety) provide details, modifications, and variations that find use in various embodiments described herein.

[0255] All publications and patents mentioned in the present application and/or listed below are herein incorporated by reference in their entireties.

EXAMPLES

[0256] The following examples are provided to further illustrate the advantages and features of the invention, but are not intended to limit the scope of this disclosure.

Materials and Methods

Microscope and image acquisition

[0257] Images were acquired on an Olympus BX-51 microscope (Olympus, Japan), using a DP-70 camera and DP manager 2.2.1 software (Olympus).

Isolation of leukocytes from the brain and liver

[0258] As previously described (Getts et al, J Exp Med. 29: 2319, 2007) leukocytes were obtained from the brains of PBS-perfused mice by digesting brains for 60 minutes at 37°C in PBS with deoxy-ribonuclease (0.005 g/ml; Sigma Aldrich) and collagenase IV (0.05 g/ml; Sigma Aldrich). Digestion was stopped with 10% FCS, and the homogenate was passed through a 70µm nylon cell strainer (Becton Dickinson, NJ, USA). The pellet, obtained after 10 minutes centrifugation at 340xg, was resuspended in 30% Percoll (Amersham, Norway) and layered over 80% Percoll. Leukocytes were collected from the 30%/80% interface after centrifugation at 1140xg for 25 minutes at room temperature. The same protocol is also used to derive leukocytes from the liver, with the tissue weighed before processing.

Isolation of leukocytes from the spleen, blood and bone marrow

[0259] For flow cytometric analysis, the right femur was dissected out and bone marrow cells flushed out using PBS loaded syringes. For bone marrow precursor isolation, femurs and tibias from at least 4 mice were utilized. The cellular suspension achieved after flushing was filtered through a 70µm cell strainer and centrifuged for 5 mins at 340g. Red blood cells in the resulting pellet were lysed in NH_4Cl-based red cell lysis buffer (BD Pharm Lyse™; BD Pharmingen), before centrifugation for 5 mins at 340xg. In the case of peripheral blood, blood was collected via cardiac puncture and immediately transferred into citrate buffer (mMol, Sigma Alrich). The resulting suspension was layered over 70% Percoll and centrifuged at 1140xg for 20 minutes at room temperature with the brake off. The interface was collected and the cells washed once in PBS, centrifuged at 340xg. For the isolation of splenic leukocytes, spleens were passed through a 7070µm cell strainer and centrifuged for 5

mins at 340g. Red blood cells in the resulting pellet were lysed in NH_4Cl-based red cell lysis buffer (BD Pharm Lyse™; BD Pharmingen), before centrifugation for 5 mins at 340xg.

Flow cytometry

[0260] Cells collected (as described above) from the brain, liver, blood, and bone marrow were washed in PBS, and blocked with anti-CD16/CD32 antibody (Biolegend). Viable cells were counted using trypan blue exclusion, which routinely showed >95% cell viability.

[0261] Cell surface molecule expression was measured and cell sorts carried out on a FACS ARIA (Becton Dickinson), equipped with an Argon ion and HeNe laser. Viable populations were gated by forward and side scatter and identified fluorescent populations determined by forward-gating thereafter. Sorting was carried out using specific fluorescent and scatter parameters identifying the population of interest. Sorting stringencies was set to purity to achieve >98% purity for bone marrow populations.

[0262] Acquired FACS data files were analysed using the flow cytometry program, Flow Jo (FlowJo, Ashland, OR, USA). Quantification of cell populations of interest were calculated based on flow cytometry percentages at analysis and absolute cell counts from each organ.

Induction and evaluation of Experimental Autoimmune Encephalitis (EAE)

[0263] Mice were injected sub-cutaneously with emulsion containing 0.1mg MOG Peptide (MEVGWYRSPFSRVVHLYRNGK (SEQ ID NO:1); Auspep, Parkville, Victoria, Australia; >95% HPLC purified) and Complete Freund's adjuvant containing 2mg/mL Mycobacterium tuberculosis (Sigma Aldrich). Two days later, mice were administered 500µl Pertussis toxin (Sigma Aldrich) i.p. Mice were monitored for disease progression, and graded on the following scale: 1, limp tail and/or weakness of 1 hind limb; 2, weakness in more than one limb, gait disturbance; 3, paralysis in 1 limb; 4, paralysis in more than one limb, incontinence; 5, moribund.

Statistics

[0264] Graphs were made and computerized statistical analysis was performed in GraphPad Prism, and InStat, respectively (both programs from GraphPad software, San Diego, CA, USA). Depending on the data, an unpaired, two-tailed Student t-test, or one way ANOVA with a Tukey-Kramer post-test was performed, with $P < 0.05$ considered to be significant.

[0265] For correlation analysis between parameters such as weight loss, infiltration, and virus titre, a non-linear regression (curve fit) was used, with a second order polynomial (Y=A + B*X + C*X^2).

Example 1

Synthesis and characterization of PLG-peptide conjugates and nanoparticle formation

[0266] Poly(lactide-co-glycolic acid) (PLG) was covalently linked to either Cy5.5 fluorescent dye or antigen with the coupling reagent 1-Ethyl-3-(3-dimethylaminopropyl)carbodiimide (EDC)/N-hydroxysuccinimide (NHS). The antigen was either proteolipid protein ($PLP_{139-151}$) or ovalbumin ($OVA_{323-339}$) (**FIG. 1**).

[0267] Particles with various sizes were prepared by the double emulsion and nanoprecipitation methods. The size and zeta potential of the nanoparticle formulations were determined and are provided above in Table 1.

[0268] The coupling efficiency of antigen to PLG was analysed by ^{1}H-NMR. **FIG. 2** shows the ^{1}H-NMR spectrum of **(i)** PLG, **(ii)** $OVA_{323-339}$, and **(iii)** PLG-$OVA_{323-339}$ measured in DMSO-d6 (calibrated at 2.5 ppm). The coupling efficiency of $OVA_{323-339}$ to PLG was calculated by comparing the integration values of the overlapping methyl proton peaks of leucine and isoleucine present at 1.4 ppm in $OVA_{323-339}$ (d, d') to the methylene proton peak present at 5.3 ppm in PLG (b). A schematic representation of the polymer-conjugate nanoparticles is provided in Figure 2C.

[0269] By changing the chemistry, the coupling efficiency of PLP to PLG can be increased to about 20%.

[0270] Loading (μg antigen (Ag)/mg PLG) was precisely controlled by combining PLG-Ag conjugates with unconjugated PLG at predetermined mixing ratios (see Table 1 above).

Example 2

Size and time-dependent cellular interactions of PLG nanoparticles

[0271] Eighty nm and 400 nm PLG nanoparticles were fluorescently labeled with 1% (by wt.) PLG-Cy5.5 conjugate and incubated with bone marrow-derived dendritic cells (BMDCs) or bone marrow-derived macrophages (BMMOs) up to 4 hr at 37°C (**FIG. 3**). The blue fluorescence indicates DAPI staining of nuclei and the red fluorescence indicates PLG-Cy5.5 nanoparticles.

Example 3

BMDC surface marker characterization after treatment with PLG-OVA particles having various antigen loadings

[0272] BMDCs were treated for 3 hr with 300 μg/mL of 400 nm and 80 nm PLG-OVA nanoparticle formulations with various antigen-loadings. Non-internalized PLG-OVA nanoparticles were subsequently washed from the cell surface. The cell surface markers MHCII, CD80 and CD86 were assayed using flow cytometry after 4 days of incubation. **FIG. 4A** and **FIG. 4D** show MHCII marker expression following treatment with 400 nm and 80 nm particles, respectively. **FIG. 4B** and **FIG. 4E** show CD80 marker expression following treatment with 400 nm and 80 nm particles, respectively. **FIG. 4C and FIG. 4F** show CD86 marker expression following treatment with 400 nm and 80 nm particles, respectively. Treatment of cells with PLG-OVA nanoparticles, regardless of antigen content, resulted in significantly down-regulated MHCII and CD80 expression.

Example 4

Antigen-specific induction of regulatory T cells by PLG-OVA particles delivered to antigen presenting cells (APCs)

[0273] BMDCs or BMMOs were treated for 3 hr with 300 μg/mL of 400 nm PLG-OVA nanoparticle formulations with 8 μg/mg PLG antigen loading. Non-internalized PLG-OVA nanoparticles were subsequently washed from the cell surface prior to addition of OT-II T cells and 2 ng/mL of TGF-β1. The cells were co-cultured for 4 days prior to using flow cytometry to measure CD25 activation and foxp3 expression of T cells as indication of induction of regulatory T cells. The difference in induction in BMDC versus BMMO was significant, at $p < 0.0001$ (**FIG. 5**).

Example 5

Size- and antigen-loading-dependent CD25 activation and induction of regulatory T cells by PLG-OVA particles

[0274] Bone marrow-derived dendritic cells (BMDCs) were treated for 3 hr with 300 μg/mL of 400 nm and 80 nm PLG-OVA nanoparticle formulation. Non-internalized PLG-OVA

nanoparticles were subsequently washed from the cell surface prior to addition of OT-II T cells and 2 ng/mL of TGF-β1. The cells were co-cultured for 4 days prior to using flow cytometry to measure CD25 activation and foxp3 expression of T cells. Although both nanoparticle formulations were able to increase CD25 activation similarly, only 400 nm PLG-OVA nanoparticles could successfully induce regulatory T cells (**FIG. 6**).

Example 6

CD25 activation and induction of regulatory T cells as a function of PLG-OVA particle dose

[0275] Regulatory T cell induction is dependent on nanoparticle dose. Bone marrow-derived dendritic cells (BMDCs) were treated for 3 hr with various concentrations of 400 nm of PLG-OVA nanoparticles (8 μg/mg loading) formulation. Non-internalized PLG-OVA nanoparticles were subsequently washed from the cell surface prior to addition of OT-II T cells and 2 ng/mL of TGF- β1. The cells were co-cultured for 4 days prior to using flow cytometry to measure CD25 activation **(FIG. 7A)** and foxp3 expression **(FIG. 7B)** of T cells. Although CD25 activation reached a maximum at 50 μg/mL, foxp3 expression appeared to plateau at 300 mg/mL.

Example 7

Size- and concentration-dependent biodistribution of PLG particles

[0276] Mice were injected either intravenously (IV) or subcutaneously (SC) with 1.25 mg of 400 nm or 80 nm PLG-Cy5.5 nanoparticle formulation. Cells from the liver, kidney, heart, lung, spleen and inguinal lymph nodes were isolated. Data was analyzed by flow cytometry 24 hr after injection. The liver is the primary site of particle accumulation (**FIG. 8A**).

[0277] The proportion of cells that were CD45+ versus CD45- was determined for liver, spleen and lung (**FIG. 8B**).

[0278] Mice were injected intravenously with 1.25 mg of PLG-Cy5.5 nanoparticle formulations of various particle sizes. Data was analyzed by flow cytometry 24 hr after injection. The proportion of Cy5.5+ cells found in the liver, spleen and lung was determined for a given particle size (**FIG. 8C**). The vast majority of 400 nm and 200 nm PLG-Cy5.5 nanoparticles were found in the liver. About 50% of CD45+ cells contained 80 nm and 200 nm PLG-Cy5.5 nanoparticles, whereas only about 5% to about 10% of CD45- cells contained 80 nm and 200 nm PLG-Cy5.5 nanoparticles, respectively. By contrast, about 75-80% of

both CD45+ and CD45- cells contained 400 nm PLG-Cy5.5 nanoparticles (**FIG. 8D**). Injection of either 0.625 mg or 1.25 mg of 400 nm PLG-Cy5.5 nanoparticles leads to accumulation of about 100% of the particles in both CD45+ and CD45- cells **(FIG. 8E)**.

Example 8

PLG particles are associated with neutrophils and monocytes in the blood

[0279] Healthy mice (n=3) were injected intravenously with 1.25 mg of 400 nm or 80 nm PLG-Cy5.5 nanoparticle formulation. Blood was collected and analyzed by flow cytometry 2 hr after injection. Expression of CD11b, CD11c, Gr-1 and Ly6c markers were used to identify the types of leukocytes. Cy5.5 fluorescence was used to determine which cells had 80 nm and 400 nm PLG-Cy5.5 nanoparticles. PLG-Cy5.5 particles are associated with neutrophils and monocytes in the blood (**FIG. 9**).

Example 9

PLG particles induce regulatory T cells ex vivo and induce tolerance in experimental autoimmune encephalitis (EAE)

[0280] BMDCs, splenic dendritic cells or liver dendritic cells were treated for 3 hr with 300 μg/mL of either OVA alone or 400 nm PLG-OVA nanoparticle formulations (8 μg/mg PLG antigen loading). Non-internalized PLG-OVA nanoparticles were subsequently washed from the cell surface prior to addition of OT-II T cells and 2 ng/mL of TGF-β1. The cells were co-cultured for 4 days prior to using flow cytometry to measure CD25 activation and foxp3 expression of T cells as indication of induction of regulatory T cells.

[0281] Liver and splenic dendritic cells were activated with just OVA alone, whereas activation of BMDCs was not significantly different between treatment with OVA versus PLG-OVA (**FIG. 10A**).

[0282] Mice were injected intravenously with 1.25 mg of PLG-Cy5.5 nanoparticle formulations. Data was analyzed by flow cytometry 24 hr after injection.Cells in the spleen exhibiting Cy5.5 fluorescence had the highest level of CD25 activation and foxp3 expression, indicative of regulatory T cell induction (**FIG. 10B**).

[0283] PLG nanoparticles were investigated with the immunodominant proteolipid protein $PLP_{139-151}$ epitope (PLG-$PLP_{139-151}$) to induce tolerance for prevention of Relapsing

Experimental Autoimmune Encephalitis (R-EAE). The R-EAE mice were generated as described above.

[0284] The peptides administered to the animals were covalently coupled to particles. Mice were treated with either $PLP_{139-151}$-PLG (N=3-7) or PBS buffer on day -7 relative to the time of immunization (day 0). Peak disease was typically observed around day 12 to 14, and mice were scored for clinical disease. PBS buffer only did not prevent disease induction. However, PLG particles covalently coupled with $PLP_{139-151}$ produced a clinical score of 0 (no disease) at all except low clinical scores of under 1 exhibited between days 20 and 30 (**FIG. 10C**). The cumulative disease scores as measured from 0-30 days post immunization clearly show that treatment of mice with nanoparticle formulations resulted in significantly abrogated clinical disease scores compared to controls **(FIG. 10D).**

Example 10

Controlled Delivery of Single or Multiple Antigens in Tolerogenic Nanoparticles using Peptide-polymer Bioconjugates

Synthesis of antigen-polymer bioconjugates and particle preparation

[0285] Encephalitogenic proteolipid peptides ($PLP_{139-151}$ or $PLP_{178-191}$) and ovalbumin peptide ($OVA_{323-339}$) were conjugated to the terminal carboxylic acid group of PLG (4200 g/mol; 0.17 dL/g) using carbodiimide chemistry (Figure 11A. Figure 19, and Figure 20). Coupling efficiencies were determined by ^{1}H-NMR characterization to be 73.6%, 74.1%, and 66.9%, respectively (Figure 11B). Two sizes (400 nm and 80 nm) of acPLG-Ag particles (antigen-conjugated PLG-Ag particles) were prepared using the solvent evaporation emulsion method (S.E) and nanoprecipitation method, respectively. Ag loadings were controlled by admixing Ag-PLG bioconjugates with unmodified PLG at various ratios (Figure 11C). Given these coupling efficiencies, a maximum Ag loading (μg of Ag per mg of particle) of 211 μg/mg (266 μg/mg theoretical), 218 μg/mg (274 μg/mg theoretical), and 220 μg/mg (297 μg/mg theoretical) is possible to be achieved for acPLG-$PLP_{139-151}$, acPLG-$PLP_{178-191}$, and acPLG-$OVA_{323-339}$, respectively. The size of the acPLG-Ag particles prepared by the S.E. method was minimally affected by varying the Ag loading to 25 μg/mg, but increased slightly with antigen loadings of 50 μg/mg and higher (Table 4). However, surface coupling of Ag to PLG particles led to significantly increased size and polydispersity. The sizes for particles prepared by nanoprecipitation trended upwards depending on Ag loading and a maximum

loading of only 2 μg/mg could be achieved. The zeta potential was not impacted by the Ag loading and was highly negative for all acPLG particles (between -30 to -56 mV). These experiments confirmed that acPLG particles could be prepared with controllable Ag loadings through systematic combination of PLG-Ag bioconjugates with unmodified PLG with well-controlled physicochemical properties.

[0286] acPLG particles were compared to Ag-coupled PLG particles (PLG-Ag), and Ag-encapsulated PLG particles (PLG(Ag)) for Ag-specific antibody binding to their surface using a fluorescence-tagged $OVA_{323-339}$-IgG1. Encapsulation of Ag into particles (PLG(Ag)) has been demonstrated to reduce the potential for antibody binding to particle that could result in immune activation *in vivo*. Binding to the surface of the three particle variations demonstrated significantly less binding of IgG1 to acPLG-$OVA_{323-339}$ (8 μg/mg) than PLG-$OVA_{323-339}$ particles (7.5 μg/mg) (Figure 1D). Ag-encapsulated PLG($OVA_{323-339}$) bound the least amount of IgG1, however a maximal antigen loading of only 3 μg/mg was achievable. The decreased IgG1 binding is suspected to result from the significantly lower Ag loading and burst release of Ag, that was similarly observed for other PLG particles Importantly, acPLG particles did not display any significant burst release of Ag compared to PLG(Ag) particles (Figure 11E).

Regulatory T cell induction by acPLG-Ag particles is size and Ag loading-dependent

[0287] The ability of acPLG-Ag particles to promote antigen presentation by dendritic cells and subsequently influence the activation of naïve $CD4^+CD25^-$ T cells and induce the formation of regulatory T cells (Tregs) was next investigated *in vitro* as a function of particle size and Ag loading. Treg induction was used to determine tolerogenic effects of acPLG particles because they have been shown to mediate immune tolerance *in vivo*. Delivery of both 80 and 400 nm acPLG-$OVA_{323-339}$ particles to bone-marrow derived dendritic cells (BMDCs) followed by co-culture with Ag-specific naïve OTII $CD4^+CD25^-$ T cells in the presence of TGFβ resulted in upregulation of CD25 on T cells, even at the lowest Ag loading conditions tested (Figure 12A and 12B). Although CD25 expression was increased by both acPLG-$OVA_{323-339}$ particle sizes, it did not correlate with Treg induction as measured by CD25 and Foxp3 expression. Tregs were induced at high levels only with the 400 nm acPLG-$OVA_{323-339}$ particles, and was dependent on Ag loading (Figure 12C). At a NP concentration of 300 μg/mL, maximal Treg induction was observed at an Ag loading of 8 μg/mg and there was no significant difference observed by increasing the loading to 150 μg/mg. acPLG-$OVA_{323-339}$ particles with a diameter of 80 nm, regardless of Ag loading, only induced low

levels of Tregs (Figure 12D). Taken together, the T cell expression of CD25 was particle size independent and induction of Tregs was particle size dependent. Importantly, we found that at high concentrations, acPLG-OVA$_{323-339}$ particles up to 150 μg/mg loading were not significantly different than particles with 8 μg/mg loading for inducing Tregs *in vitro*.

Regulatory T cell induction by acPLG-Ag nanoparticles is particle concentration-dependent

[0288] The concentration dependency of acPLG particles on the activation of naïve $CD4^+CD25^-$ T cells and induction of Tregs was tested using S.E. acPLG-OVA$_{323-339}$ at multiple Ag loadings (2, 8, 25, 150 μg/mg) and particle concentrations (0, 5, 10, 75, 150, and 300 μg/mL). The range of Ag delivered to the BMDCs varied from 10 to 45,000 ng/mL (Table 4). A minimum of 1,200 ng/mL of Ag was required to achieve CD25 expression in greater than 40% of CD4 T cells. This level of expression was achieved even at low acPLG concentrations (5-10 μg/mL) with 150 μg/mg Ag loading (Figure 13A). Similar CD25 expression was achieved using acPLG particles with 8 μg/mg Ag loading at a NP concentration of 150 μg/mL (1,200 ng/mL Ag delivered). CD25 expression over 60% of CD4 T cells occurred for an Ag concentration of 1,875 ng/mL or greater. Foxp3 expression on $CD4^+CD25^+$ T cells required a larger amount of Ag to reach the highest expression levels (over 30%). Treg induction correlated to levels of CD25 expression greater than 60% of CD4 T cells. Treg induction by acPLG-OVA$_{323-339}$ particles was highly dependent on the total amount of Ag delivered per well. Additional Ag delivered over 1,875 ng/mL did not dramatically influence the percentage of Tregs detected *in vitro* (Figure 13B). acPLG particles prepared with various Ag loadings enabled the Ag requirements to induce significant levels of Tregs *in vitro* to be determined and presents the possibility to utilize acPLG particles to modulate biological responses *in vivo*.

Table 4. Concentration of antigen delivered per well as a function of acPLG-OVA$_{323-339}$ particle concentration and loading. Bolded and italicized cells represent the protein loadings evaluated in Figure 13.

Particle loading (μg/mg)/Concentration (μg/mg)	0	5	10	75	150	300
0	0	0	0	0	0	0
2	0	10	20	150	300	600
4	0	20	40	300	600	1200

8	0	40	80	600	1200	2400
25	0	125	250	1875	3750	7500
50	0	250	500	3750	7500	15000
150	0	750	1500	11250	22500	45000

acPLG-Ag particles suppress EAE induced by $PLP_{139-151}$ immunization

[0289] The ability of acPLG-Ag particles to induce Ag-specific immune tolerance was tested using the R-EAE disease model of MS. While the *in vitro* data support particle internalization, Ag presentation, and Treg induction, the *in vivo* study is more challenging since the NPs must reach the appropriate cell types to elicit a tolerogenic response. In previous studies, Ag-encapsulated PLG($PLP_{139-151}$) particles were administered with Ag loading of approximately 2-3 μg/mg at a dose of 2.5 mg. Using a prophylactic disease model, acPLG-$PLP_{139-151}$ particles were administered intravenously to SJL/J mice on day -7 relative to R-EAE immunization. Untreated control mice displayed severe clinical symptoms, whereas acPLG-$PLP_{139-151}$ particle-treated mice displayed significantly reduced disease symptoms as measured by both the mean clinical score (Figure 14A) and cumulative clinical score (Figure 14B). Furthermore, the acPLG-$PLP_{139-151}$ particles demonstrated similar effectiveness as Ag-encapsulated PLG($PLP_{139-151}$) particles given at a dose of 2.5 mg (Figures 14A-14B). These results confirmed that the higher Ag loading in acPLG particles could enable the dose of acPLG particles to be reduced with similar abilities to induce tolerance *in vivo*.

acPLG particles suppress EAE induced with a cocktail of encephalitogenic peptides ($PLP_{139-151}$ and $PLP_{178-191}$)

[0290] Diversity in the autoreactive T cell repertoire has been well established in autoimmune diseases such as MS; therefore, tolerogenic NPs will likely need to deliver multiple epitopes to effectively treat a disease whose pathogenesis can be complex. We tested if multiple myelin peptide–PLG bioconjugates, namely PLG-$PLP_{139-151}$ and PLG-$PLP_{178-191}$, could be incorporated into a single acPLG particle at precise Ag loadings and be used as an effective treatment for R-EAE induced by immunization with $PLP_{139-151}$/$PLP_{178-191}$/CFA (Figure 15A).

[0291] acPLG particles were administered intravenously to SJL/J mice on day -7 relative to R-EAE immunization. Control mice, treated with acPLG-$OVA_{323-339}$, acPLG-$PLP_{139-151}$, or

acPLG-$PLP_{178-191}$ particles, displayed severe clinical disease symptoms compared to acPLG-$PLP_{139-151,178-191}$ particles as measured by both the mean clinical score (Figure 15B) and cumulative clinical score (Figure 15C). Interestingly, the acute disease of mice treated with acPLG-$PLP_{139-151}$ particles displayed a strong acute disease phase and a less severe relapse. This result was in contrast to mice treated with acPLG-$PLP_{178-191}$ particles where a reduced acute disease was observed and a severe relapse occurred. Mice treated with acPLG-$PLP_{139-151,178-191}$ displayed significantly reduced acute and relapse disease scores that resulted in a major diminishment in the measured cumulative scores. These results demonstrate the ability for acPLG particles to simultaneously tolerize against multiple peptides associated with the pathogenesis of disease. The modular design of acPLG particles incorporating various Ags using a PLG-Ag bioconjugate "mix-and-match" approach clearly demonstrates the versatility of the acPLG particle platform and design.

[0292] Soluble peptide, Ag-coupled cells, genetically engineered food products, and particles have been investigated as treatment options for applications including allergy, autoimmune disease, and cell transplantation. An advantage of the particles of the current invention (acPLG particles) over current nano-based tolerance platforms is that tolerance induction by acPLG particles is achieved without co-delivery of immunosuppressive agents that have been associated with many side effects. Differences in uptake mechanism and context of Ag presentation of acPLG particles may partially account for platforms such as soluble Ag arrays, tolerogenic nanoparticles (tNPs), and PEGylated gold nanoparticles requiring co-delivery of various immunomodulatory agents to induce tolerance. The results presented herein demonstrate a novel NP platform that achieves precise control over Ag delivery and tolerogenic responses *in vivo*. This controllable Ag delivery platform enabled the identification of the relationship between Ag loading, concentration, and size of acPLG particles with respect to the activation of T cells and induction of Tregs *in vitro*.

Materials and Methods:

[0293] Poly(lactide-co-glycolide) (50:50) (PLG) with a single carboxylic acid end-group and an inherent viscosity of 0.17 dL/g in hexafluoro-2-propanol was purchased from Lactel Absorbable Polymers (Birmingham, AL). Poly(ethylene-alt-maleic anhydride) (PEMA) was purchased from Polyscience, Inc. (Warrington, PA). Amine-terminated ovalbumin peptide (NH_2-$OVA_{323-339}$) and proteolipid peptide (NH_2-$PLP_{139-151}$ or NH_2-$PLP_{178-191}$) was purchased from Genscript (Piscataway, NJ). All other reagents were purchased from Sigma Aldrich (St. Louis, MO) unless noted otherwise.

PLG-Ag bioconjugation

[0294] PLG (37.8 mg, 0.009 mmol, 4200 g/mol) of was dissolved in 2 mL of N,N-dimethylformamide (DMF) in a 20 mL scintillation vial equipped with a stir bar. N-(3-Dimethylaminopropyl)-N'-ethylcarbodiimide hydrochloride (EDC) (9.0 mg, 0.047 mmol, 5X to PLG) was dissolved in 0.5 mL of DMF and added dropwise to the PLG solution. N-Hydroxysuccinimide (NHS) (5.5 mg, 0.047 mmol, 5X to PLG) was dissolved in 0.5 mL DMF and added dropwise to the solution. The reaction was allowed to stir for 15 minutes at room temperature. Antigenic peptide (1.2X to PLG) was dissolved in a solution of 1 mL dimethyl sulfoxide (DMSO) and 0.5 mL DMF and stirred at 400 RPM. Triethylamine (5X to peptide) was added to peptide solution and the mixture was added dropwise to the stirring PLG solution. The reaction was allowed to proceed overnight at room temperature. The resulting polymer was isolated and purified by dialysis using 3,500 molecular weight cut-off membrane against four liters of distilled water over two days. Distilled water was replaced a total of six times. The dialyzed polymer was collected and washed with MilliQ water three times MilliQ water by centrifugation at 7000 x g before resuspension in 20 mL of water and lyophilization for two days. Coupling efficiency peptide to PLG was determined by NMR analysis in DMSO-d6.

Mice

[0295] Female SJL/J mice (6-8 weeks) were purchased from Harlan Laboratories (Indianapolis, IN). OT-II mice (B6.Cg-Tg(TcraTcrb)425Cbn/J) were purchased from Jackson Laboratory (Bar Harbor, ME).

Nanoparticle Preparation

[0296] Nanoparticles (acPLG) of two different sizes (80 and 400 nm) were prepared following either the nanoprecipitation or emulsion solvent evaporation method, respectively. To produce acPLG particles using the emulsion solvent evaporation method, Ag-polymer bioconjugates were combined with unconjugated PLG at various ratios to give calculated Ag loadings in particles as described in Table 4. The method has been described in our previous publications. To prepare smaller, approximately 80-120 nm acPLGs, the nanoprecipitation method was employed. Briefly, 100 mg of PLG (Ag-polymer bioconjugates and unconjugated PLG at desired ratios) was dissolved in acetonitrile at a concentration of 1 mg/mL and poured into 300 mL of MilliQ water under rapid stirring. The solutions were

stirred for 24-48 h to completely remove residual acetonitrile. The acPLG particles were recovered using an ultracentrifuge membrane filter 10 kDa MWCO at 4000 x g. Cryoprotectants (4% (w/v) sucrose and 3% (w/v) mannitol) were then added to the particles before lyophilization.

Nanoparticle characterization

[0297] The size and zeta potential of the nanoparticles was determined by dynamic light scattering (DLS) by mixing 10 μL of a 25 mg/mL particle solution into 990 μL of MilliQ water using a Malvern Zetasizer ZSP (Westborough, MA). The release of peptide from PLG($OVA_{323-339}$) and acPLG-$OVA_{323-339}$ particles was measured over 72 hr. Approximately 8 mg of each particle was dispersed in 1 mL of PBS and incubated at 37 °C. At pre-determined time points, the particles were centrifuged at 7000 x g for 5 min and 0.5 mL of supernatant was collected. The particles were resuspended and 0.5 mL of fresh PBS was added to each sample. All supernatant samples were stored at -20 °C until the experiment was completed. After the final time point, the pellet of particles was dissolved in DMSO and the total amount of remaining protein was determined. Protein content was determined using the Micro BCA assay (Pierce, Waltham, MA).

$OVA_{323-339}$-IgG1 binding in vitro

[0298] $OVA_{323-339}$ antibody (Innovagen, Sweden) was fluorescently labeled with FITC using Abcam Easy Link FITC Conjugation Kit (Abcam, Cambridge, MA). 20 μg of acPLG particles were incubated with 1 mg/mL FITC-labeled $OVA_{323-339}$ antibody for 20 min at 4 °C and washed. Fluorescence was measured using a Beckman Coulter CyAn ADP Analyzer (Indianapolis, IN). Statistical differences between groups was determined by performing a one-way ANOVA and Tukey's Post-hoc test ($p<0.05$).

Cell culture

[0299] BMDC media consisted of RPMI containing L-glutamine (Life Technologies, Carlsbad, CA) supplemented with penicillin (100 units/mL), streptomycin (100 mg/mL), 10% heat-inactivated fetal bovine serum (FBS) (Invitrogen Corporation, Carlsbad, CA) and 50 mM β-mercaptoethanol (Sigma Aldrich). Co-culture media was the same without β-mercaptoethanol and supplemented with 1 mM sodium pyruvate, and 0.1 mM non-essential amino acids (Life Technologies, Carlsbad, CA).

Antibodies and Flow cytometry

[0300] FcR blocking was performed with anti-CD16/32 (Biolegend) prior to staining with various combinations of the following antibodies: anti-CD4 (RM4-5), -CD25 (PC61) (Biolegend), and -Foxp3 (FJK-16s) (eBioscience, San Diego, CA). Viability was assessed with fixable violet dead cell stain kit (Invitrogen, Carlsbad, CA). Foxp3 staining was performed with eBioscience staining kit according to the manufacturer's protocol. Cytometric data were collected using a Beckman Coulter CyAn ADP Analyzer. Analysis was performed using FlowJo (FlowJo, Ashland, OR).

Cell isolation and in vitro Treg induction assay

[0301] Treg induction assays were carried out with slight modifications as described. $CD4^+CD25^-Foxp3^-$ T cells were isolated from the spleen of OT-II mice using a naïve $CD4^+$ T cell isolation kit (Miltenyi Biotec, San Diego, CA). The assay was carried out in T cell media. Bone marrow-derived dendritic cells (2×10^4/well) were seeded into 96-well round-bottom cell culture plates and incubated with acPLG-$OVA_{323-339}$ of various particle concentrations and Ag loadings for 3 hours. Following incubation, all wells were washed to remove excess particles that had not been internalized by cells. Cells were co-cultured with 2×10^4/well naïve T cells in the presence of 2 ng/mL TGF-β1 (Cell Signaling Technology, Danvers, MA). Groups receiving antigen in lieu of acPLG-$OVA_{323-339}$ received soluble $OVA_{323-339}$ (100 ng/mL) at this time. After 4 days of co-culture, the T cells were collected, stained for viability, CD4, CD25, and Foxp3, and analyzed using flow cytometry. Statistical differences between groups was determined by performing a one-way ANOVA and Tukey's Post-hoc test ($p<0.05$).

R-EAE disease induction and measurement

[0302] R-EAE was induced by immunization with encephalitogenic peptides as previously described. To induce R-EAE with $PLP_{139-151}$ or both $PLP_{139-151}$ and $PLP_{178-191}$, mice were immunized by s.c. administration of 100 μL of 1 mg/mL $PLP_{139-151}$/complete Freund's adjuvant (CFA) or 0.25 mg/mL of $PLP_{139-151}$/CFA and 0.5 mg/mL of $PLP_{178-191}$/CFA, respectively, distributed over 3 spots on the nape and hind flanks of SJL/J mice. Disease severity in individual mice was assessed using a 0 to 5 point scale: 0 = no disease, 1 = limp tail or hind limb weakness, 2 = limp tail and hind limb weakness, 3 = partial hind limb paralysis, 4 = complete hind limb paralysis, 5 = moribund. Differences between disease

courses of different treatment groups were analyzed for statistical significance using the Kruskal-Wallis test.

Table 5: Size and zeta potential of the nanoparticle formulations used in this study. Ag loading (μg Ag/mg PLG) was precisely controlled by combining PLG-Ag conjugates with unconjugated PLG at predetermined mixing ratios. *ac-PLG-$PLP_{139-151,\ 178-191}$ particles contained 8 μg/mg of both $PLP_{139-151}$ and $PLP_{178-191}$.

Particle	Loading (μg/mg)	Size (nm ± S.D.)	Zeta (mV ± S.D.)
PLG	0	521.5 ± 23.0	-56.0 ± 0.7
acPLG-$OVA_{323-339}$	2	322.0 ± 4.0	-49.9 ± 4.9
acPLG-$OVA_{323-339}$	4	326.6 ± 5.8	-44.7 ± 1.5
acPLG-$OVA_{323-339}$	8	321.5 ± 8.5	-43.8 ± 1.8
acPLG-$OVA_{323-339}$	25	345.5 ± 5.2	-37.9 ± 0.4
acPLG-$OVA_{323-339}$	50	468.0 ± 6.5	-36.4 ± 0.7
acPLG-$OVA_{323-339}$	150	558.1 ± 5.3	-38.9 ± 0.5
acPLG-$PLP_{139-151}$	8	656.5 ± 13.7	-45.5 ± 1.4
acPLG-$PLP_{178-191}$	8	490.9 ± 15.0	-51.3 ± 1.0
acPLG-$PLP_{139-151,\ 178-191}$	16*	454.7 ± 17.4	-45.0 ± 0.9
PLG($PLP_{139-151}$)	1.4	384.7 ± 10.4	-45.9 ± 0.8
PLG	0	72.2 ± 1.9	-33.5 ± 1.1
acPLG-$OVA_{323-339}$	0.1	74.8 ± 0.3	-34.5 ± 0.3
acPLG-$OVA_{323-339}$	0.5	85.6 ± 1.9	-31.5 ± 1.2
acPLG-$OVA_{323-339}$	1	103.9 ± 0.3	-32.4 ± 0.6
acPLG-$OVA_{323-339}$	2	112.0 ± 0.6	-32.0 ± 0.9

Example 11

Covalent modification of ovalbumin protein with poly(lactide-co-glycolide), TIMP formulation, and in vitro Treg induction assay

[0303] Covalent modification of polymers with proteins offers numerous advantages to improve the physicochemical properties of nanoparticulate drug delivery systems. Importantly, properties such as protein loading as well as nanoparticle size and zeta potential are easier to control.

[0304] Ovalbumin contains numerous CD4 ($OVA_{323-334}$; $OVA_{265-280}$), CD8 ($OVA_{257-264}$), and B cell epitopes. One of the outstanding questions is whether TIMP encapsulating complete ovalbumin (TIMP-OVA) is capable of tolerizing all antigenic epitopes on CD4, CD8 and B cells. Because the precise number of these epitopes is known within the ovalbumin protein and the particles being used can exquisitely control the amount of protein and polymer used,

the molecular quantities of antigen required to tolerize differential T and B cell receptors can be addressed. As such the dose for different T cell epitopes within the same protein can be addressed.

General Experimental Design

[0305] Full-length ovalbumin (OVA) protein was conjugated to high molecular weight and low molecular weight PLGA. Furthermore, once the conjugation was confirmed, TIMP-OVA particles with various controlled loadings of OVA were prepared and characterized.

[0306] The progression of experiments is as follows:

1. Synthesis of PLGA-OVA bioconjugates using EDC/NHS chemistry.
2. Solubility testing of resultant PLGA-OVA conjugates in DCM and DMSO to determine suitability for use in particle formation.
3. Determination of the coupling efficiency of PLGA-OVA conjugates thus enabling TIMP-OVA particles to be prepared at various and pre-determined Ag loadings.
4. Formulation of TIMP-OVA particles with Ag-loadings that varied from 0 to 150 μg OVA/mg PLGA.
5. Characterization of TIMP-OVA particles by DLS and zeta potential analysis.

Table 6: Reagents for synthesis of PLGA-OVA bioconjugates:

Compound	Molecular weight (g/mol)
N-(3-dimethylaminopropyl)-N'-ethylcarbodiimide hydrochloride (EDC)	191.70
N-hydroxysuccinimide (NHS)	115.09
Poly(lactide-co-glycolide) (low molecular weight)	4200
Poly(lactide-co-glycolide) (high molecular weight)	43478
Ovalbumin grade V (OVA)	44278
N,N-Diisopropylethylamine (DIPEA)	129.24

[0307] OVA contains 20 lysine groups available for covalent modification. Additionally, 14 aspartic acids and 33 glutamic acids are contained within OVA.

[0308] Due to the differential solubility of PLGA and OVA, a solvent system to perform the conjugation reactions as well as the appropriate stoichiometric ratio of PLGA to OVA needs

to be determined to yield a polymer-Ag conjugate with high solubility in organic solvents such as DCM or DMSO that are necessary for particle fabrication.

[0309] To address these questions experimentally, varying the molar ratio of PLGA to OVA from 5 to 20 six-conjugation reactions were performed. A maximum ratio of 20 PLGA: 1 OVA was chosen based on the protein structure of OVA where 20 lysine residues are available for coupling with the terminal carboxylic acid group of PLGA. Furthermore, two molecular weights of PLGA were tested for conjugation efficiency and solubility testing. The choice of these reaction conditions was determined to yield the greatest potential to obtain a PLGA-OVA bioconjugate with the necessary Ag contents and solubility requirements. A summary of the reactions conditions is presented in Table 7.

[0310] Table 7 shows conditions for Ovalbumin conjugation. 6 reaction conditions were evaluated with the goal to completely solubilize OVA and PLGA in the same solvent system during the reaction. Furthermore, the stoichiometric ratio of PLGA to OVA was varied to yield a final product that was soluble in dimethyl sulfoxide (DMSO).

Table 7. Conditions for Ovalbumin conjugation

Lot no.	Stoichiometric ratio (PLGA:OVA)
03-23-L1 (LMW PLGA)	5
03-23-L2 (LMW PLGA)	10
03-23-L3 (LMW PLGA)	20
03-23-H1 (HMW PLGA)	5
03-23-H2 (HMW PLGA)	10
03-23-H3 (HMW PLGA)	20

[0311] Table 8 shows reaction conditions for Ovalbumin conjugation using low (L) and high (H) molecular weight PLGA. PLGA was prepared at a concentration of 25 mg/mL in DMSO. OVA was prepared at a concentration of 25 mg/mL in MilliQ water. Prior to addition of OVA to the solution containing PLGA, the concentration of PLGA was adjusted to 5 mg/mL to prevent precipitation of the polymer during the conjugation reaction. Furthermore, the solvent ratio was maintained to contain between 15-20 Vol/Vol% MilliQ water in DMSO during the conjugation of PLGA to OVA.

Table 8. Reaction conditions for Ovalbumin conjugation

Reagents	03-23-L1	03-23-L2	03-23-L3
PLGA (25 mg/mL)	949 µL	1.89 mL	3.79 mL
EDC (50 mg/mL)	216.6 µL	433 µL	866 µL
NHS (25 mg/mL)	260 µL	520 µL	1040 µL

DIPEA	9.84 µL	19.7 µL	39.4 µL
Additional DMSO	3.8 mL	7.594 mL	15.188 mL
OVA (25 mg/mL)	2 mL	2 mL	2 mL
Additional water			1.69 mL

Reagents	03-23-H1	03-23-H2	03-23-H3
PLGA (25 mg/mL)	3.92 mL	3.92 mL	3.92 mL
EDC (50 mg/mL)	86 µL	172 µL	344 µL
NHS (25 mg/mL)	103.5 µL	207 µL	414 µL
DIPEA	3.92 µL	7.84 µL	15.68 µL
Additional DMSO	15.7 mL	15.7 mL	15.7 mL
OVA (25 mg/mL)	0.8 mL	0.4 mL	0.2 mL
Additional water	2.69 mL	3.13 mL	3.40 mL

Protocol for PLGA-OVA conjugation using volumes listed in Table 7.

[0312] The following protocol was used. A 60 mL glass scintillation vial containing a magnetic stirbar was prepared. Separately, a 20 mL glass scintillation vial containing the appropriate amount of OVA, additional water, and DIPEA was prepared. The appropriate amount of PLGA dissolved in DMSO and the specified additional DMSO was added to the 60 mL scintillation vial. Under stirring (300 – 600 RPM) the appropriate amount of EDC was added dropwise to the PLGA solution and stirred for 5 min. Under stirring (300 – 600 RPM) the appropriate amount of NHS was added dropwise to the EDC-activated PLGA solution and stirred for an additional 10 min. Under stirring (300 – 600 RPM) the water solution containing OVA and DIPEA was added dropwise to the NHS-activated PLGA solution. (Note that the solutions should be transparent when finished adding this solution to PLGA.) The reaction was allowed to proceed overnight at room temperature. To recover the PLGA-OVA conjugate, the product-containing solution was transferred to a 3500 Da MWCO dialysis membrane and dialyze against 4L of MilliQ water for 2 days to remove any unreacted EDC/NHS/DIPEA and to remove DMSO. (Note: the product may precipitate in the dialysis bag. Change the water in the dialysis beaker at least 6 times over 2 days.) To collect the product, the precipitate was transferred from the dialysis bag to 50 mL conical centrifuge tubes. The material was centrifuged at 7000 x g for 15 min at 4° C to pellet the product. The product was washed by resuspension and centrifugation twice more. The final product was resuspended in 5 mL of MilliQ water, freeze, and lyophilize for 2 days or until the product is dry.

PLGA-OVA conjugate solubility testing.

[0313] To evaluate the solubility of PLGA-OVA conjugates in solvent utilized for particle formulation, approximately 1 mg of conjugate was placed into a 1.5 mL MCT. The results are presented in Table 9. It was identified that conjugates 03-23-L3, and 03-23-H1-3 were soluble in DMSO. This enabled those conjugates to be characterized further.

[0314] Table 9 shows solubility testing of PLG-OVA polymer conjugates in DMSO. The precipitate observed after DCM addition is minimal in all cases and does not appear like it would affect particle formation.

Table 9. Solubility testing of PLG-OVA polymer conjugates in DMSO

Polymer conjugate	Comments
03-23-L1	Not soluble in water, 50:50 DMSO:water, or DMSO
03-23-L2	Not soluble in water, 50:50 DMSO:water, or DMSO
03-23-L3	Soluble DMSO. Slight precipitate with DCM added.
03-23-H1	Soluble DMSO. Slight precipitate with DCM added.
03-23-H2	Soluble DMSO. Slight precipitate with DCM added.
03-23-H3	Soluble DMSO. No precipitate with DCM added.

BCA assay of PLG-OVA conjugates to determine coupling efficiency.

[0315] Due to the insolubility of 03-23-L1 and 03-23-L2 in DMSO, these samples were not evaluated for protein content.

[0316] The protein content present per milligram of polymer was determined using the Pierce BCA protein assay kit (Cat no. 23225). Results are reported in Table 10.

Table 10: Concentration of PLGA-OVA conjugates in DMSO and measured protein content using the BCA assay.

Polymer conjugate	Concentration of PLG-OVA in DMSO used for BCA assay	Protein content (µg/mg)
03-23-L3	2 mg/mL	379 ± 5.5
03-23-H1	5 mg/mL	141 ± 9.8
03-23-H2	10 mg/mL	59.4 ± 1.9
03-23-H3	20 mg/mL	38.1 ± 4.7

Protocol for particle fabrication using PLGA-OVA conjugate 03-23-L3

Table 11: Formulation parameters for TIMP-OVA with varied Ag loading.

Formulation	Ag loading	PLG-OVA conjugate	PLGA	Total
1	150	11.86 mg	18.14 mg	30 mg
2	50	9.88 mg	65.12 mg	75 mg
3	25	9.88 mg	140.12 mg	150 mg
4	8	3.16 mg	146.84 mg	150 mg
5	4	1.58 mg	148.42 mg	150 mg
6	2	0.79 mg	149.21 mg	150 mg
7	0.5	0.2 mg	149.80 mg	150 mg
8	0	0 mg	150 mg	150 mg
Total		37.36 mg	967.64 mg	1005 mg

[0317] PLGA at a concentration of 200 mg/mL in DCM was prepared.

[0318] PLG-OVA (03-23-L3) at a concentration of 25 mg/mL in DMSO was prepared.

Table 12: Formulation specifications for production of TIMP-OVA with various Ag loading.

Formulation	Ag loading	PLG-OVA conjugate	PLGA	Total	1% PEMA	0.5% PEMA
1	150	474.4 µL	907 µL (20 mg/mL)	30 mg	3.75 mL	30 mL
2	50	395.2 µL	1628 µL (40 mg/mL)	75 mg	5 mL	75 mL
3	25	395.2 µL	1401.2 µL (100 mg/mL)	150 mg	10 mL	150 mL
4	8	126.4 µL	734.2 µL (200 mg/mL)	150 mg	10 mL	150 mL
5	4	63.2 µL	742.1 µL (200 mg/mL)	150 mg	10 mL	150 mL
6	2	746.1 µL	31.6 µL (200 mg/mL)	150 mg	10 mL	150 mL
7	0.5	8 µL	749 µL (200 mg/mL)	150 mg	10 mL	150 mL
8	0	0 µL	750 µL (200 mg/mL)	150 mg	10 mL	150 mL

Total		37.36 mg	967.64 mg	1005 mg		

Procedure for TIMP-OVA formulation

[0319] The following protocol was used.

1.1. Clean the sonicator with acetone, ethanol and then water.

1.2. Pipette the appropriate volume of PLGA as noted in the above table into a 20 mL scintillation vial.

1.3. Pipette the appropriate volume of PLG-OVA as noted in the above table into the same 20 mL scintillation vial from step 1.2.

1.4. Add the appropriate volume of 1% PEMA to the 20 mL scintillation vial containing PLGA and PLG-OVA.

1.5. Sonicate the solution for 30 seconds at 100% amplitude.

1.6. Pour sonicated mixture into the appropriate volume of 0.5% w/v poly(ethylene-*alt*-maleic anhydride) dissolved in water under stirring at 300 RPM.

1.7. Stir particles overnight to evaporate dichloromethane.

1.8. Prepare solutions of cryoprotectants (sucrose 10g /25 mL MilliQ water; mannitol 6g /20 mL MilliQ water). The mannitol solution will take time to dissolve and will require heating. Heat at 70 °C for 15-30 min with frequent vortexing. Upon storage, the mannitol will crystalize out of solution and need to be heated again. The sucrose solution should be soluble at all times. It is acceptable to use premade solutions and heat up the mannitol again.

1.9. Pass particle solution through a 40 μm cell strainer. Distribute the solution into 50 mL falcon tubes.

1.10. Allow particles to chill on ice for 15 min.

1.11. Centrifuge under a relative centrifugal force of 7000 x g for 15 minutes at 4°C.

1.12. Aspirate supernatant completely.

1.13. Add 3 mL of 1 M sodium bicarbonate-sodium carbonate buffer to each tube and allow particles to chill on ice for 15 min.

1.14. Resuspend the pellets using a 1 mL pipette or a pipette aid equipped with a 5 mL serological pipette.

1.15. After the pellet is dispersed well (no visible aggregates), add 1 M sodium bicarbonate-sodium carbonate buffer to each tube until total volume is 25 mL.

1.16. Centrifuge under a relative centrifugal force of 7000 x g for 15 minutes at 4°C.

1.17. Aspirate supernatant completely.

1.18. Add 3 mL of 1 M sodium bicarbonate-sodium carbonate buffer to each tube and allow particles to chill on ice for 15 min.

1.19. Resuspend the pellets. After the pellet is dispersed well, add 1 M sodium bicarbonate-sodium carbonate buffer to each tube until the total volume is 25 mL.

1.20. Centrifuge under a relative centrifugal force of 7000 x g for 15 minutes at 4°C.

1.21. Aspirate supernatant completely.

1.22. Add 3 mL of MilliQ water into the tube and allow particles to chill on ice for 15 min.

1.23. Resuspend the pellet. After the pellet is dispersed well, add additional MilliQ water until the particle concentration is between 4-8 mg/mL. Assuming that the recovery of particle will be 40%.

1.24. Homogeneously disperse the particles in the water.

1.25. Pass particle solution through a 40 μm cell strainer.

1.26. Prepare sample tubes for lyophilization, 2 mL tubes for particle aliquoting. Pre-mass at least 1-3 of those tubes to determine the amount of particles per tube.

1.27. Pipette 800 μL of the particle solution into each tube and save at least 200 μL of particle solution for characterization by DLS/Zeta analysis in a 1.5 mL microcentrifuge tube (only need to use 20 μL of particle sample in MilliQ water to perform DLS/Zeta analysis).

1.28. For each sample tube that gets cryoprotectant, mix 100 μL of the sucrose and 100 μL of the mannitol solutions together and add to the particles with mixing by pipette. The total volume per tube will now be 1 mL. The concentration of cryoprotectant will be 4% w/v sucrose and 3% w/v Mannitol.

1.29. Freeze all samples, including the ones with no cryoprotectant, except for the sample to be used for DLS/Zeta analysis (put in 4 deg. Fridge for characterization later) in the -80 freezer for at least 5 hr.

1.30. Lyophilize the samples for 1-2 days.

Table 13: Measurement of the size and zeta potential of TIMP-OVA particles

Particle	Size (nm)	Zeta potential (mV)	PDI
TIMP-OVA150	847.7 ± 33.4	-60.4 ± 1.2	0.710
TIMP-OVA50	464.0 ± 12.8	-28.6 ± 0.2	0.410
TIMP-OVA25	340.6 ± 6.2	-29.1 ± 0.9	0.190
TIMP-OVA8	405.8 ± 8.8	-34.7 ± 0.9	0.270
TIMP-OVA4	386.2 ± 2.5	-33.0 ± 0.6	0.260
TIMP-OVA2	518.5 ± 3.4	-34.9 ± 0.9	0.370
TIMP-OVA0.5	391.1 ± 3.8	-35.6 ± 0.4	0.230

PLG blank (IMP)	286.9 ± 0.4	-39.7 ± 0.3	0.130

Evaluation of the biological activity of TIMP-OVA conjugates using an in vitro Treg induction assay.

[0320] The objective of this study was to determine the effect of antigen loading in polymer conjugate TIMP-OVA on the induction of naïve CD4+ T cells (OTII) to regulatory T cells (CD4+CD25+Foxp3+).

Experimental Groups:

Particle	Ag or particle dose	TGF-b dose
TGF ONLY	0 ng/mL	2 ng/mL
$OVA_{323-339}$	100 ng/mL	2 ng/mL
OVA	100 ng/mL	2 ng/mL
OVA	1000 ng/mL	2 ng/mL
OVA	10000 ng/mL	2 ng/mL
TIMP(OVA) 02-204 10 µg/mg	300 µg/mL	2 ng/mL
TIMP-$OVA_{323-339}$ 8 µg/mg	300 µg/mL	2 ng/mL
TIMP-OVA 150 µg/mg	5, 10, 75, 150, 300 µg/mL	2 ng/mL
TIMP-OVA 25 µg/mg	5, 10, 75, 150, 300 µg/mL	2 ng/mL
TIMP-OVA 8 µg/mg	5, 10, 75, 150, 300 µg/mL	2 ng/mL
TIMP-OVA 2 µg/mg	5, 10, 75, 150, 300 µg/mL	2 ng/mL
PLG blank (IMP)	300 µg/mL	2 ng/mL

[0321] The amount of OVA antigen per mL of media was calculated based on the dose of TIMP-OVA and the loading amount of OVA protein per mg of TIMP. The bolded and italicized cells in Table 14 indicate the particles that were tested in the Treg experiment. Importantly, the amount of Ag delivered per well covered significant breadth from 0 ng/mL to 45000 ng/mL.

Table 14: Antigen calculation per mL in each well treated with TIMP-OVA

Particle loading (µg/mg)/Concentration (µg/mg)	**0**	**5**	**10**	**75**	**150**	**300**
0	0	0	0	0	0	0
2	0	10	20	150	300	600
4	0	20	40	300	600	1200
8	0	40	80	600	1200	2400
25	0	125	250	1875	3750	7500
50	0	250	500	3750	7500	15000
150	0	750	1500	11250	22500	45000

Bone Marrow Derived Dendritic Cell Culture (following the method of Lutz et al.)

[0322] The preparation of BMDCs was performed as described previously. DCs were prepared by culturing bone marrow cells obtained from C57BL/6 mice. Bone marrow cells were flushed from the tibias and femurs using a needle-equipped syringe. The recovered cells were incubated in ACK lysis buffer to lyse red blood cells. The bone marrow cells were cultured in RPMI-1640 medium supplemented with 10% fetal bovine serum, 100 units/mL penicillin, 100 mg/mL streptomycin, 2 mM L-glutamine, 50 uM 2-mercaptoethanol, and 20 ng/mL granulocyte-macrophage colony-stimulating factor. The culture medium was changed on days 3, 6, and 8. The cells were ready to use on day 10.

Cell isolation and in vitro Treg induction assay

[0323] CD4+CD25-foxp3- T cells were isolated from the spleen of OT-II mice (B6.Cg-Tg(TcraTcrb)425Cbn/J, Jackson Laboratory, Bar Harbor, ME) using a naïve CD4+ T cell isolation kit (Miltenyi Biotec, San Diego, CA). The assay was carried out in RMPI media supplemented with 10% fetal bovine serum, 1% pen/strep, and non-essential amino acids. APCs (2×10^4/well) were seeded into 96 well round bottom cell culture plates and treated with soluble $OVA_{323-339}$ peptide (100 ng/mL) or particles with various Ag-loadings or particle doses and co-cultured with 2×10^4/well naïve T cells in the presence of 2 ng/mL TGFβ. After 4 days of co-culture, the T cells were collected and stained for CD4, CD25, and Foxp3 and analyzed using the Cyan cytometer.

Conclusions

[0324] PLGA-OVA bioconjugates were successfully synthesized using EDC/NHS (carbodiimide) chemistry. Using the BCA assay, the protein content per mg of PLGA-OVA bioconjugate was determined. The amount of protein per mg was dependent on the polymer molecular weight as well as the stoichiometric ratio of PLGA:OVA. The PLGA-OVA conjugate with the highest protein content was 03-23-L3 and the lowest was 03-23-H3.

[0325] As a starting point, TIMP-OVA particles were formulated with various Ag loadings from 0 μg/mg to 150 μg/mg using the PLGA-OVA conjugate 03-23-L3 due to its high protein loading capability. TIMP-OVA particles prepared using 03-23-L3 displayed sizes measured by DLS between 300 nm and 850 nm. TIMP-OVA 150 μg/mg displayed an unusually high PDI greater than 0.7. The zeta potentials of TIMP-OVA ranged between -30 and -60 mV.

[0326] Preliminary in vitro testing using a Treg induction assay that characterized the ability of various TIMP-OVA particles to induce regulatory T cells in the presence of TGFb indicated that the protein remained active following conjugation and TIMP formulation. It should be noted that TIMP-OVA did not appear to be as effective as TIMP-$OVA_{323-339}$ or TIMP(OVA) particles with similar loadings.

[0327] While specific embodiments of the invention have been described and illustrated, such embodiments should be considered illustrative of the invention only and not as limiting the invention as construed in accordance with the accompanying claims.

[0328] All patents, applications and other references cited herein are incorporated by reference in their entireties.

EDITORIAL NOTE

2016379413

Non consecutive page numbering for the claims. Claims pages are 95 to 99

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WHAT IS CLAIMED IS:

1. A composition comprising one or more antigens covalently attached to a carrier particle having a negative zeta potential between about -100 mV and 0 mV, wherein said one or more antigens are encapsulated in said particle by covalent attachment to the internal particle surfaces, optionally wherein said antigens are further attached to the surface of said particle.

2. The composition of claim 1, wherein the composition further comprises an unconjugated carrier polymer.

3. The composition of any one of claims 1-2, wherein the zeta potential of the particle is between about -100 mV and about -15 mV, between about -100 mV and about -75 mV, or between about -50 mV and about -20 mV.

4. The composition of any one of claims 1-3, wherein the particle comprises a co-polymer having a molar ratio from about 50:50, 80:20 to about 100:0.

5. The composition of any one of claims 1-4, wherein the particle comprises poly(lactic-co-glycolic acid).

6. The composition of any one of claims 1-5, wherein the particle has an average diameter of between about 0.1 μm to about 10 μm, between about 0.3 μm to about 5 μm, between about 0.5 μm to about 3 μm, or between about 0.5 μm to about 1 μm.

7. The composition of any one of claims 1-6, wherein said one or more antigens comprises one or more epitopes.

8. The composition of claim 7, wherein the one or more antigens or one or more epitopes is associated with an allergy, an autoimmune disease, an enzyme used in enzyme replacement therapy, lysosomal storage disease, or an inflammatory disease or disorder.

9. The composition of claim 8, wherein the one or more antigens or one or more epitopes is associated with type 1 diabetes, multiple sclerosis, Systemic Lupus, Neuromyelitis Optica, Idiopathic Thrombocytopenic Purpura, Thrombotic Thrombocytopenic Purpura, Membranous Nephropathy, Bullous Phemphigoid, Phemphigus Vulgaris, Myasthenia Gravis, a mucopolysaccharide storage disorder, gangliosidosis, alkaline hypophosphatasia, cholesterol ester storage disease, hyperuricemia, growth hormone deficiency, renal anemia, Gaucher's disease, Fabry's disease, Hurler's disease, Hunter's disease, Maroteaux-Lamy

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disease, hemophilia A, hemophilia B, von Wilebrand disease, venous thrombosis, purpura fulminans, mucopolysaccaridosis VI, pompe disease, Celiac's disease, inflammatory bowel disease, including Crohn's disease and ulcerative colitis, primary biliary cholangitis, rheumatoid arthritis (RA), scleroderma, Sjogren's disease, vitiligo, alopecia (baldness), polyglandular failure, Grave's disease, hypothyroidism, polymyositis, pemphigus foliaceus, autoimmune hepatitis, Addison's disease, membranous nephropathy, uveitis, or pernicious anemia.

10. The composition of claim 8, wherein the one or more antigens or one or more epitopes comprises all or part of myelin basic protein, acetylcholine receptor, endogenous antigen, myelin oligodendrocyte glycoprotein, pancreatic beta-cell antigen, insulin, proinsulin, IGRP, glutamic acid decarboxylase (GAD), collagen type 11, human cartilage gp39, fp130-RAPS, proteolipid protein, fibrillarin, small nucleolar protein, thyroid stimulating factor receptor, histones, glycoprotein gp70, pyruvate dehydrogenase dehydrolipoamide acetyltransferase (PCD-E2), hair follicle antigen, A-gliaden, gliaden, human tropomyosin isoform 5, Bahia grass pollen (BaGP), peach allergen Pru p 3, alpha s 1-Caein Milk allergen, Apig1 celery allergen, Bere1 Brazil nut allergen, B-Lactoglobulin Milk allergen, Bovine serum albumin, Cor a 1.04 Hazelnut allergen, myelin associated glycoprotein, aquaporin, α3 chain of type IV collagen, Ovalbumin Egg allergen, Advate, antihemophilic factor, Kogenate, Eloctate, recombinant factor VIII Fc fusion protein, Refacto, Novo VIIa, recombinant factor VII, eptacog alfa, Helixate, Monanine, Coagulation Factor IX, Wilate, Ceredase, Alglucerase, Cerezyme, Imiglucerase, Elelso, taliglucerase alfa, Fabrazyme, Agalsidase beta, Aldurazyme, -I-iduronidase, Myozyme, Acid-glucosidase, Elaprase, iduronate-2-sulfatase, Naglazyme arylsufatase B, or N-acetylgalactosamine-4-sulfatase.

11. The composition of any one of claims 1-10, wherein said one or more antigens is directly covalently bound to said carrier particle.

12. The composition of any one of claims 1-11, further comprising a pharmaceutically acceptable carrier.

13. A method of inducing antigen-specific tolerance in a subject comprising: administering to said subject an effective amount of a composition comprising one or more antigens covalently attached to a carrier particle having a negative zeta potential between about -100 mV and 0 mV, wherein said one or more antigens is encapsulated in said particle

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by covalent attachment to the internal particle surfaces, optionally wherein said antigens are further attached to the surface of said particle.

14. The method of claim 13, wherein said administering is performed to treat or prevent a disease or condition, optionally wherein said disease or condition is selected from the group consisting of: an autoimmune disease, a lysosomal storage disease, an enzyme deficiency, inflammatory disease, an allergy, transplantation rejection, and a hyperimmune response.

15. The method of claim 14, wherein said disease or condition is selected from the group consisting of: multiple sclerosis, type 1 diabetes, asthma, a food allergy, an environmental allergy, Celiac disease, inflammatory bowel disease, including Crohn's disease and ulcerative colitis, a mucopolysaccharide storage disorder, gangliosidosis, alkaline hypophosphatasia, cholesterol ester storage disease, hyperuricemia, growth hormone deficiency, renal anemia Hemophilia, Hemophilia A, Hemophilia B, von Willebrand disease, Gaucher's Disease, Fabry's Disease, Hurler's Disease, Pompe's Disease, Hunter's Disease, Maroteaux-Lary Disease and a condition caused by said antigen in said subject to reduce overreaction to said antigen.

16. The method of any one of claims 13-15, wherein the administration of the composition i) results in the induction and expansion of both antigen specific and non-specific regulatory T cells ii) prevents the accumulation of neutrophils and other granulocytes in the subject, and/or iii) minimizes or eliminates burst release of one or more antigens in the subject after administration.

17. The method of any one of claims 13-16, wherein the composition further comprises an unconjugated carrier polymer.

18. The method of any one of claims 13-17, wherein the carrier particle comprises a poly(lactic-co-glycolic acid) particle.

19. The method of any one of claims 13-18, wherein said composition is administered intravenously.

20. A method of inducing regulatory T cells comprising treating said T cells with an effective amount of a composition of any one of claims 1-12, wherein the particle size is greater than 80 nm.

21. A process for the preparation of a tolerizing immune modified particle (TIMP) having a negative zeta potential between about -100 mV and 0 mV, said process comprising:

a) covalently linking one or more carrier polymers with one or more antigens to form carrier polymer-antigen conjugates; and

b) contacting the carrier polymer-antigen conjugates with a solution under conditions effective to form the TIMP,

wherein the TIMP having a negative zeta potential is formed, and wherein the one or more antigens is encapsulated in the TIMP by covalent attachment to the internal particle surfaces, optionally wherein said antigens are further attached to the surface of said particle.

22. The process of claim 21, wherein the zeta potential of the particle is between about -100 mV and about -15 mV, between about -100 mV and about -75 mV, or between about -50 mV and about -20 mV.

23. The process of claim 21 or 22, wherein the particle comprises a poly(lactic-co-glycolic acid) particle.

24. The process of any one of claims 21-23, wherein the particle has an average diameter of between about 0.1 μm to about 10 μm, between about 0.3 μm to about 5 μm, between about 0.5 μm to about 3 μm, or between about 0.5 μm to about 1 μm.

25. The process of any one of claims 21-24, wherein the carrier polymer is formed by co-polymerization.

26. The process of any one of claims 21-25, wherein the solution has a basic pH.

27. The process of any one of claims 21-26, wherein the solution comprises sodium bicarbonate, potassium bicarbonate, lithium bicarbonate, potassium dihydrogen phosphate, sodium dihydrogen phosphate, or lithium dihydrogen phosphate.

28. The process of any one of claims 21-27, wherein said one or more antigens comprises one or more epitopes.

29. The process of claim 28, wherein the one or more antigens or one or more epitopes is associated with an allergy, an autoimmune disease, an enzyme used in enzyme replacement therapy, lysosomal storage disease, or an inflammatory disease or disorder.

30. The process of claim 29, wherein the one or more antigens or one or more epitopes is associated with type 1 diabetes, multiple sclerosis, Systemic Lupus, Neuromyelitis

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Optica, Idiopathic Thrombocytopenic Purpura, Thrombotic Thrombocytopenic Purpura, Membranous Nephropathy, Bullous Phemphigoid, Phemphigus Vulgaris, Myasthenia Gravis, a mucopolysaccharide storage disorder, gangliosidosis, alkaline hypophosphatasia, cholesterol ester storage disease, hyperuricemia, growth hormone deficiency, renal anemia, Gaucher's disease, Fabry's disease, Hurler's disease, Hunter's disease, Maroteaux-Lamy disease, hemophilia A, hemophilia B, von Wilebrand disease, venous thrombosis, purpura fulminans, mucopolysaccaridosis VI, pompe disease, Celiac's disease, inflammatory bowel disease, including Crohn's disease and ulcerative colitis, primary biliary cholangitis, rheumatoid arthritis (RA), scleroderma, Sjogren's disease, vitiligo, alopecia (baldness), polyglandular failure, Grave's disease, hypothyroidism, polymyositis, pemphigus foliaceus, autoimmune hepatitis, Addison's disease, membranous nephropathy, uveitis, or pernicious anemia.

31. The process of claim 29, wherein the one or more antigens or one or more epitopes comprises all or part of myelin basic protein, acetylcholine receptor, endogenous antigen, myelin oligodendrocyte glycoprotein, pancreatic beta-cell antigen, insulin, proinsulin, IGRP, glutamic acid decarboxylase (GAD), collagen type 11, human cartilage gp39, fp130-RAPS, proteolipid protein, fibrillarin, small nucleolar protein, thyroid stimulating factor receptor, histones, glycoprotein gp70, pyruvate dehydrogenase dehydrolipoamide acetyltransferase (PCD-E2), hair follicle antigen, A-gliaden, gliaden, human tropomyosin isoform 5, Bahia grass pollen (BaGP), peach allergen Pru p 3, alpha s 1-Caein Milk allergen, Apig1 celery allergen, Bere1 Brazil nut allergen, B-Lactoglobulin Milk allergen, Bovine serum albumin, Cor a 1.04 Hazelnut allergen, myelin associated glycoprotein, aquaporin, α3 chain of type IV collagen, Ovalbumin Egg allergen, Advate, antihemophilic factor, Kogenate, Eloctate, recombinant factor VIII Fc fusion protein, Refacto, Novo VIIa, recombinant factor VII, eptacog alfa, Helixate, Monanine, Coagulation Factor IX, Wilate, Ceredase, Alglucerase, Cerezyme, Imiglucerase, Elelso, taliglucerase alfa, Fabrazyme, Agalsidase beta, Aldurazyme, -I-iduronidase, Myozyme, Acid-glucosidase, Elaprase, iduronate-2-sulfatase, Naglazyme arylsufatase B, or N-acetylgalactosamine-4-sulfatase.

32. The process of any one of claims 21-31, wherein said one or more antigens is directly covalently bound to said carrier polymer.

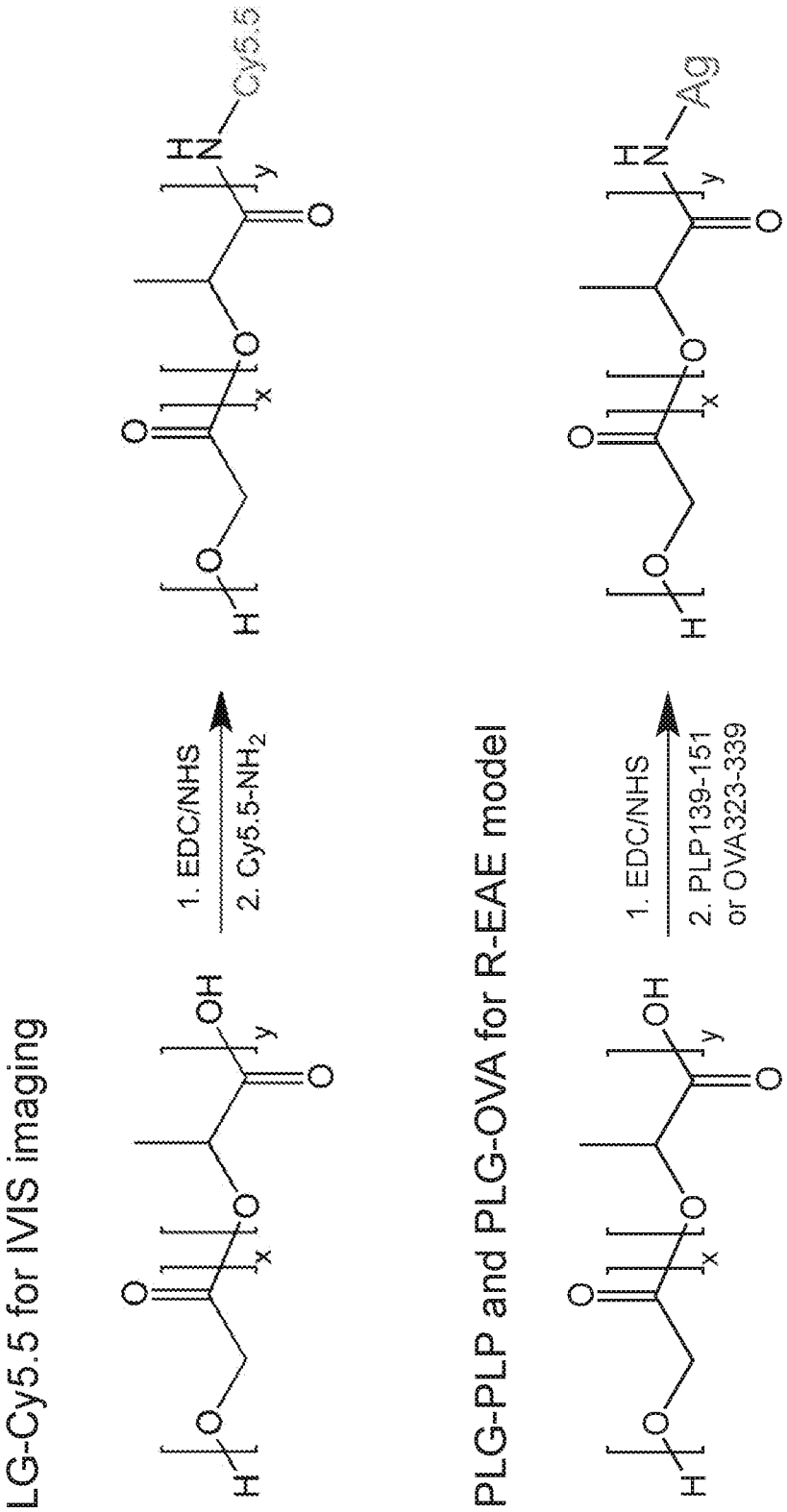

PLG-Cy5.5 for IVIS imaging
1. EDC/NHS
2. Cy5.5-NH2
PLG-PLP and PLG-OVA for R-EAE model
1. EDC/NHS
2. PLP139-151
or OVA323-339

FIG. 1

A

B

Polymer	Coupling Efficiency
PLG-$PLP_{139-151}$	13.8%
PLG-$PLP_{178-191}$	28%
PLG-$OVA_{323-339}$	7.8%

C

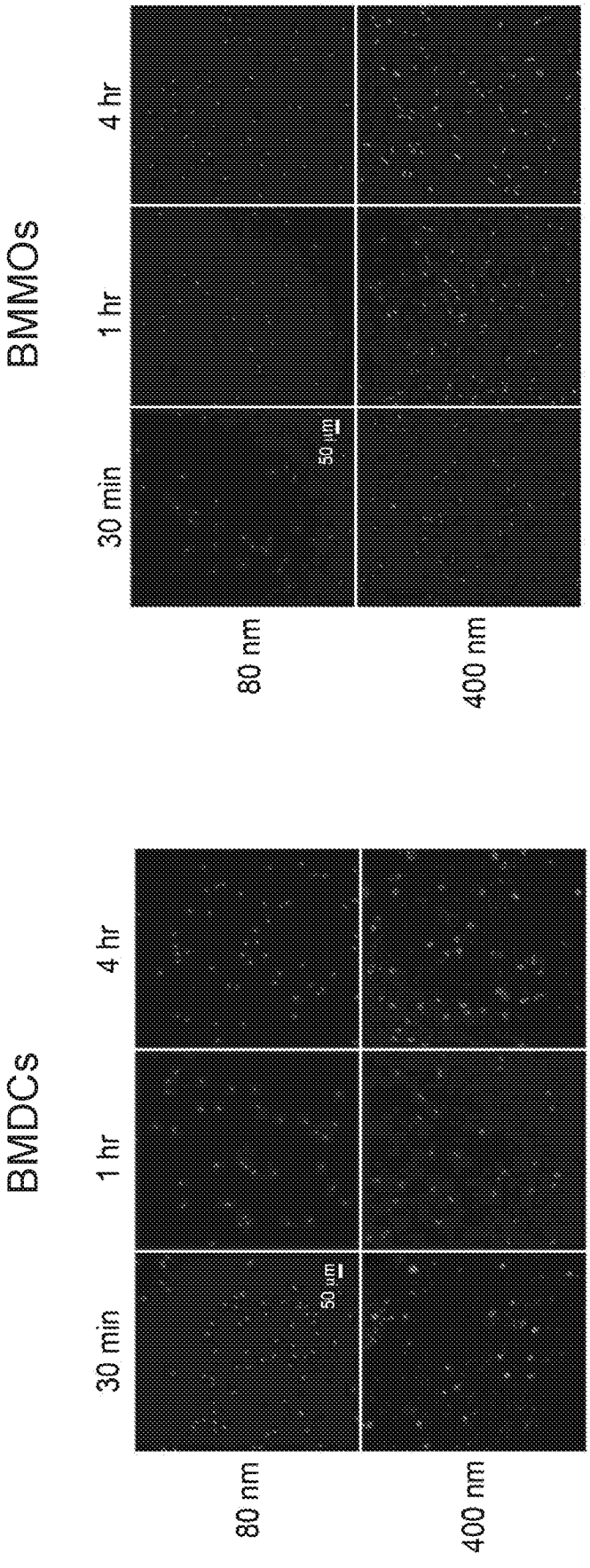

BMMOs
4 hr
1 hr
30 min
50 μm
80 nm
400 nm
BMDCs
4 hr
1 hr
30 min
50 μm
80 nm
400 nm

FIG. 3

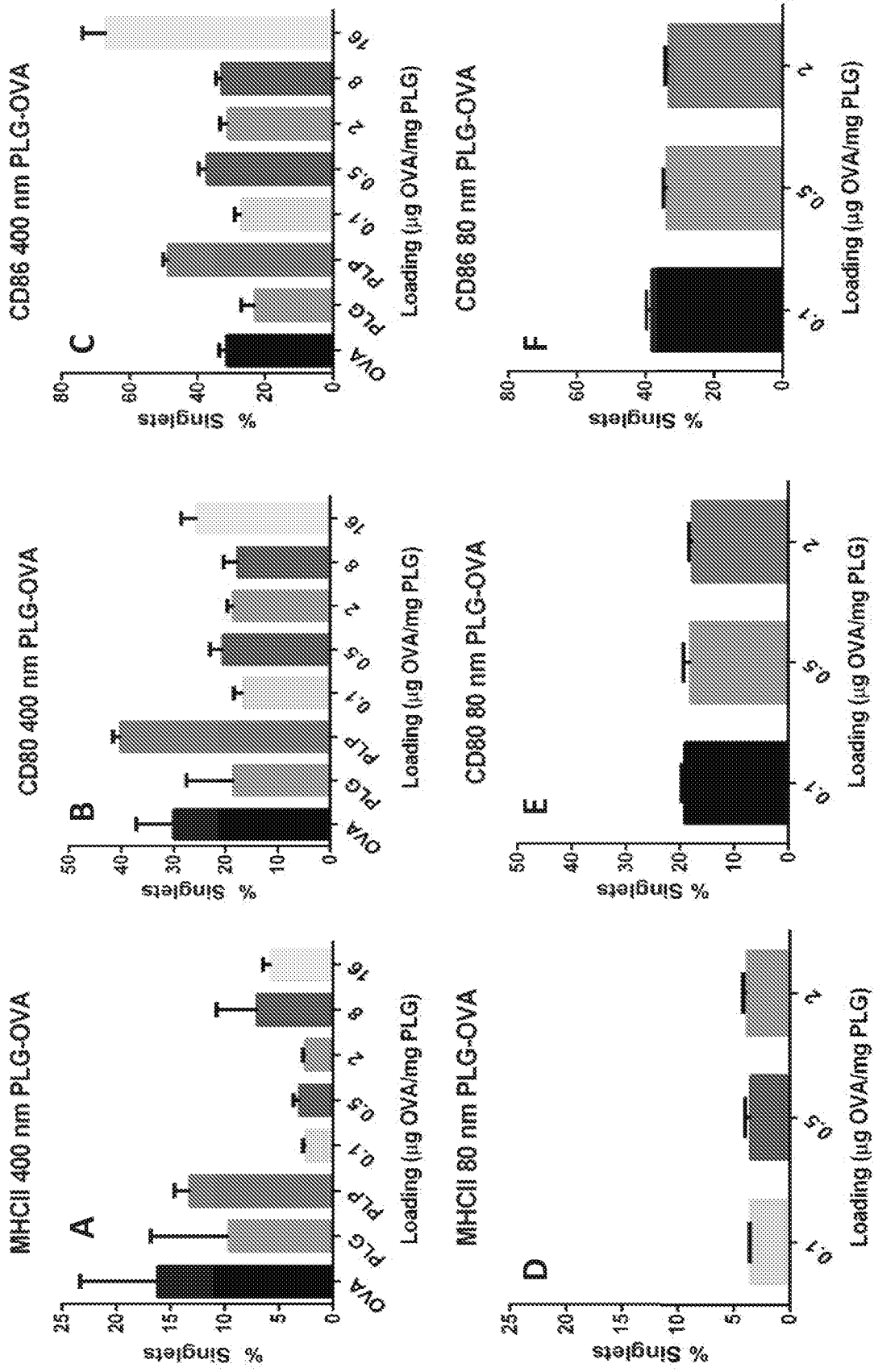

A
MHCII 400 nm PLG-OVA
B
CD80 400 nm PLG-OVA
C
CD86 400 nm PLG-OVA
D
MHCII 80 nm PLG-OVA
E
CD80 80 nm PLG-OVA
F
CD86 80 nm PLG-OVA
% Singlets
Loading (μg OVA/mg PLG)
OVA
PLG
PLP 0.1
PLP 0.5
2
8
16

FIG. 4

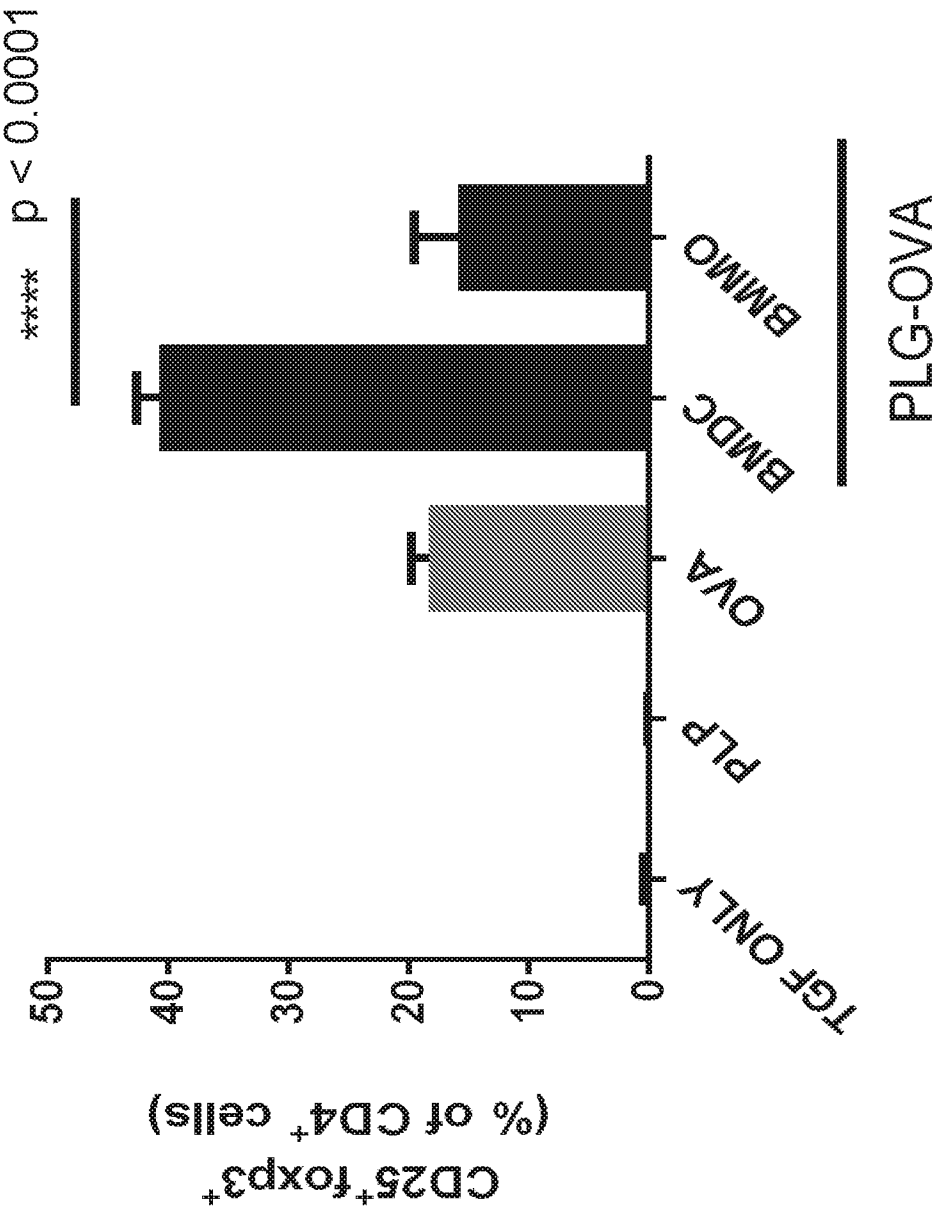

**** p < 0.0001
PLG-OVA
BMMO
BMDC
OVA
PLP
TGF ONLY
0
10
20
30
40
50
CD25+foxp3+
(% of CD4+ cells)

FIG. 5

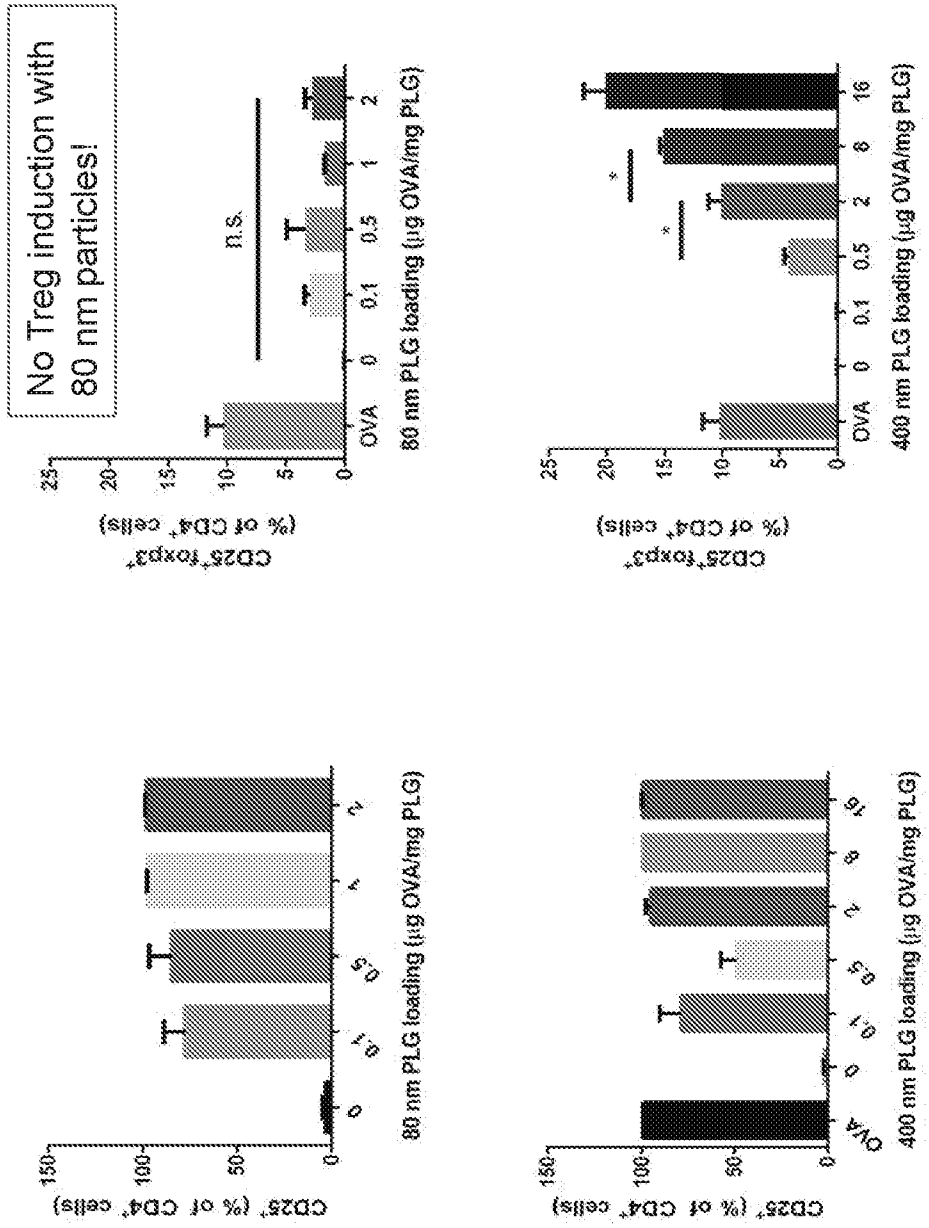

No Treg induction with 80 nm particles!
CD25+foxp3+ (% of CD4+ cells)
80 nm PLG loading (µg OVA/mg PLG)
n.s.
OVA
400 nm PLG loading (µg OVA/mg PLG)
CD25+ (% of CD4+ cells)

FIG. 6

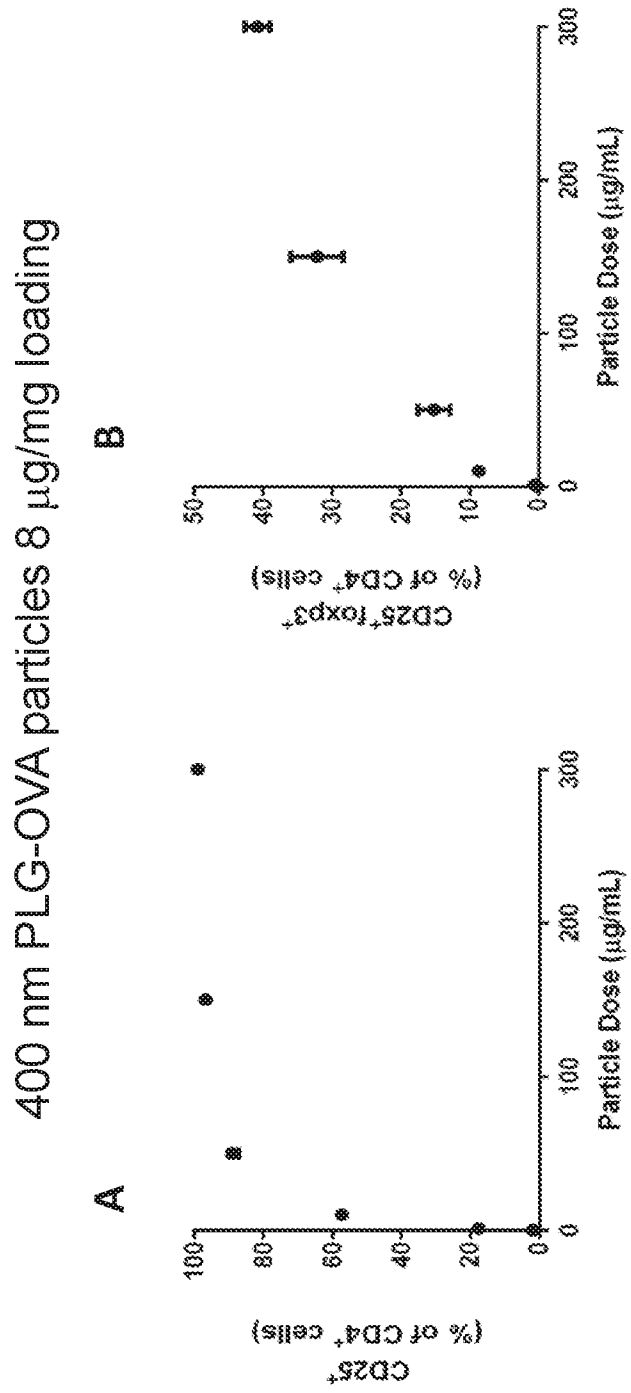

400 nm PLG-OVA particles 8 µg/mg loading
A
CD25+
(% of CD4+ cells)
100
80
60
40
20
0
0
100
200
300
Particle Dose (µg/mL)
B
CD25+Foxp3+
(% of CD4+ cells)
50
40
30
20
10
0
0
100
200
300
Particle Dose (µg/mL)

FIG. 7

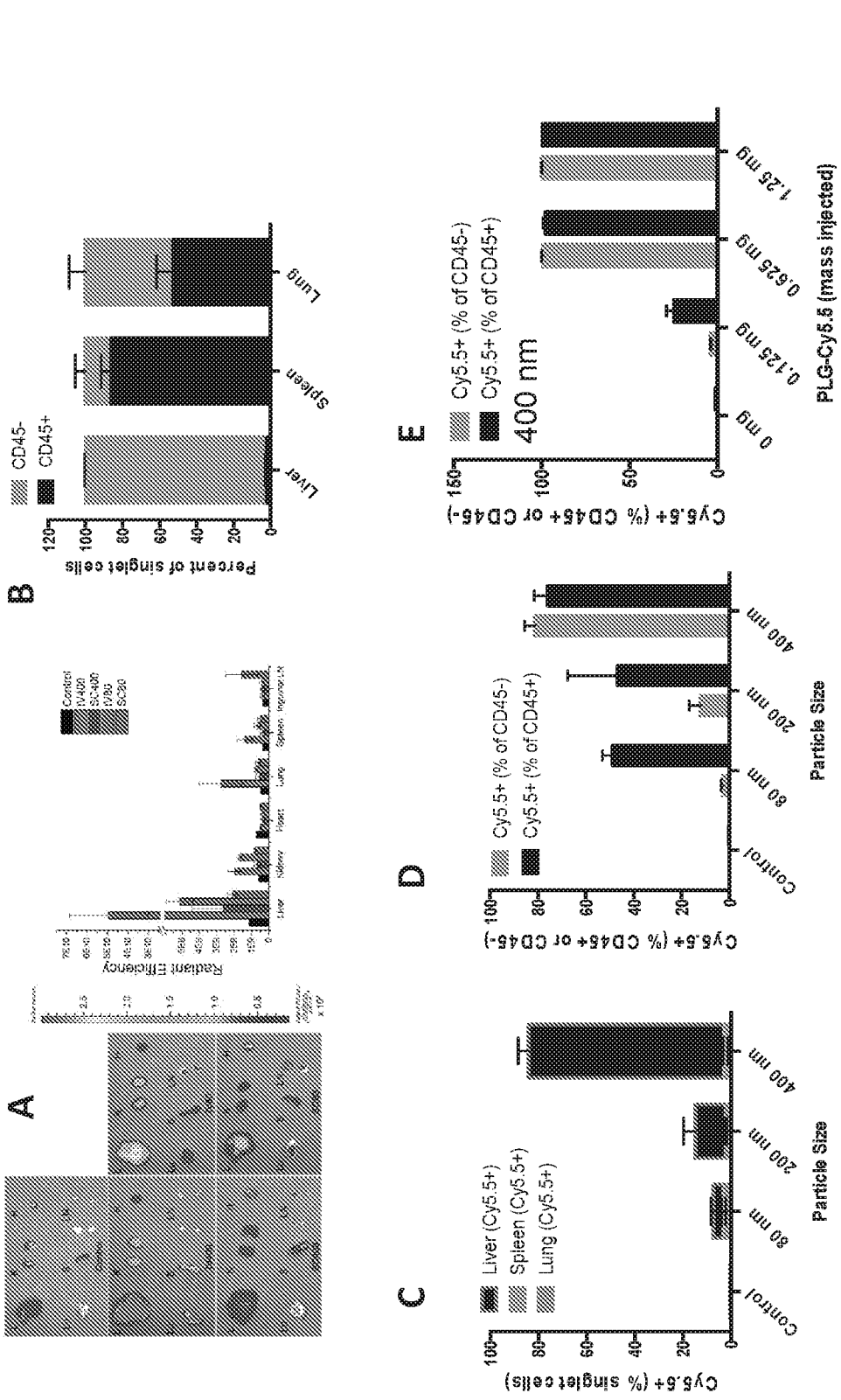

p < 0.0001
A
Radiant Efficiency
Control
IV-400
SC-400
IV-80
SC-80
Liver
Kidney
Heart
Lung
Spleen
Injection Site
B
Percent of singlet cells
CD45-
CD45+
Liver
Spleen
Lung
C
Cy5.5+ (% singlet cells)
Liver (Cy5.5+)
Spleen (Cy5.5+)
Lung (Cy5.5+)
Control
80 nm
200 nm
400 nm
Particle Size
D
Cy5.5+ (% CD45+ or CD45-)
Cy5.5+ (% of CD45-)
Cy5.5+ (% of CD45+)
Control
80 nm
200 nm
400 nm
Particle Size
E
Cy5.5+ (% CD45+ or CD45-)
Cy5.5+ (% of CD45-)
Cy5.5+ (% of CD45+)
400 nm
0 mg
0.125 mg
0.625 mg
1.25 mg
PLG-Cy5.5 (mass injected)

FIG. 8

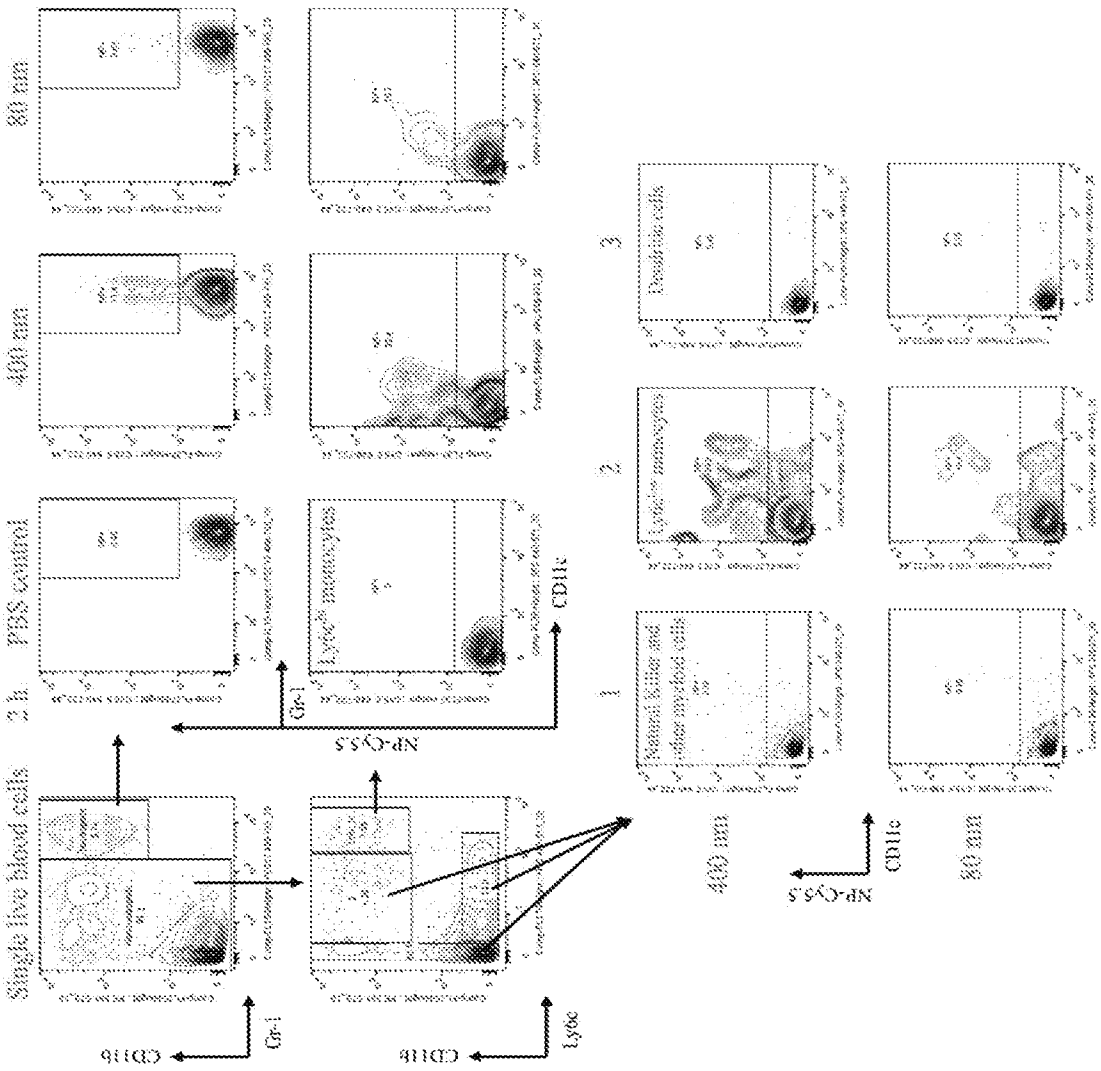

Single live blood cells
3 h
PBS control
80 nm
400 nm
Gr-1
CD11b
Ly6c
CD11c
NP-Cy5.5
Natural killer and other myeloid cells
Ly6c^hi monocytes
Dendritic cells
1
2
3

FIG. 9

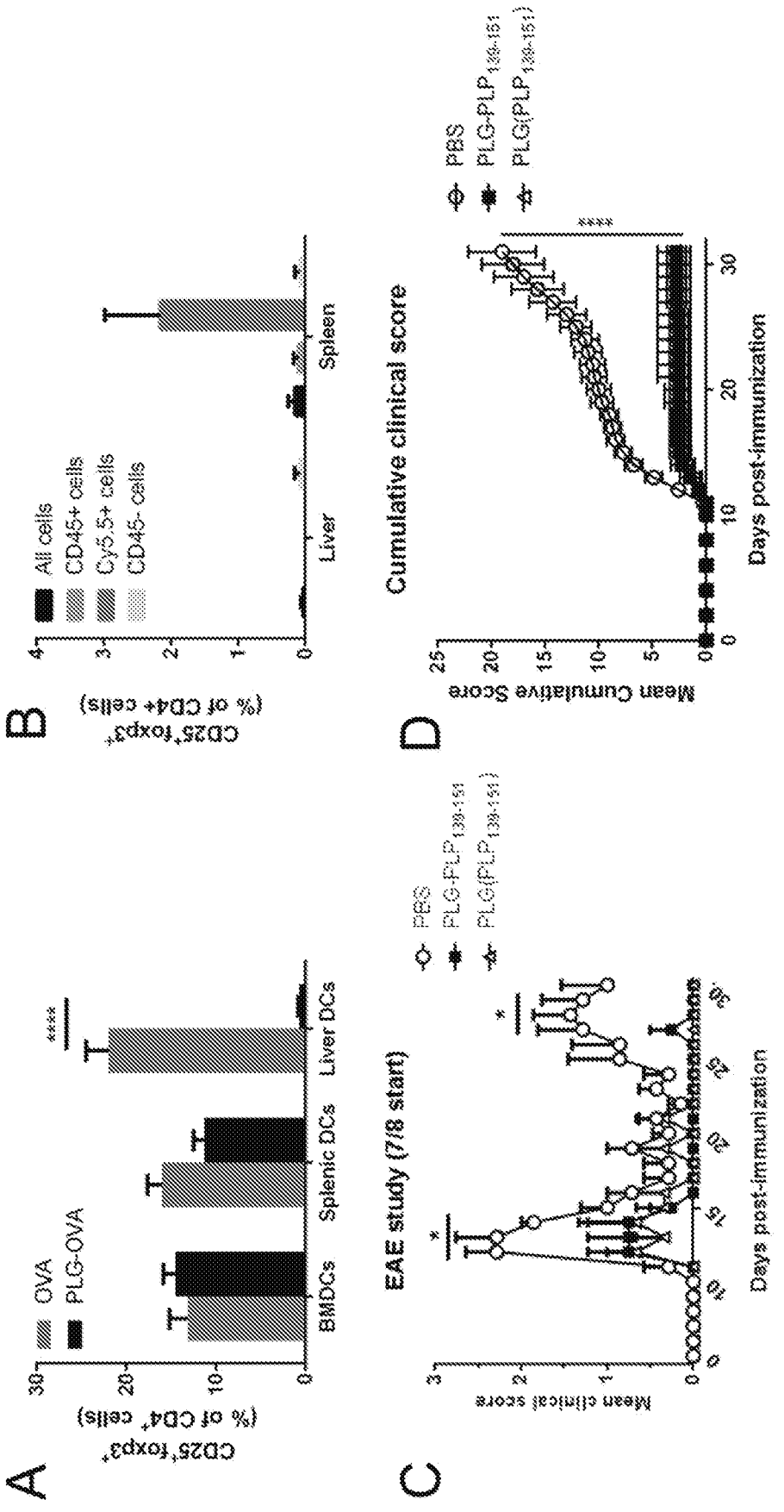

A
CD25+foxp3+ (% of CD4+ cells)
OVA
PLG-OVA
****
BMDCs
Splenic DCs
Liver DCs
B
CD25+foxp3+ (% of CD4+ cells)
All cells
CD45+ cells
Cy5.5+ cells
CD45- cells
Liver
Spleen
C
EAE study (7/8 start)
PBS
PLG-PLP139-151
PLG/(PLP139-151)
Mean clinical score
Days post-immunization
D
Cumulative clinical score
PBS
PLG-PLP139-151
PLG/(PLP139-151)
***
Mean Cumulative Score
Days post-immunization

Fig. 10

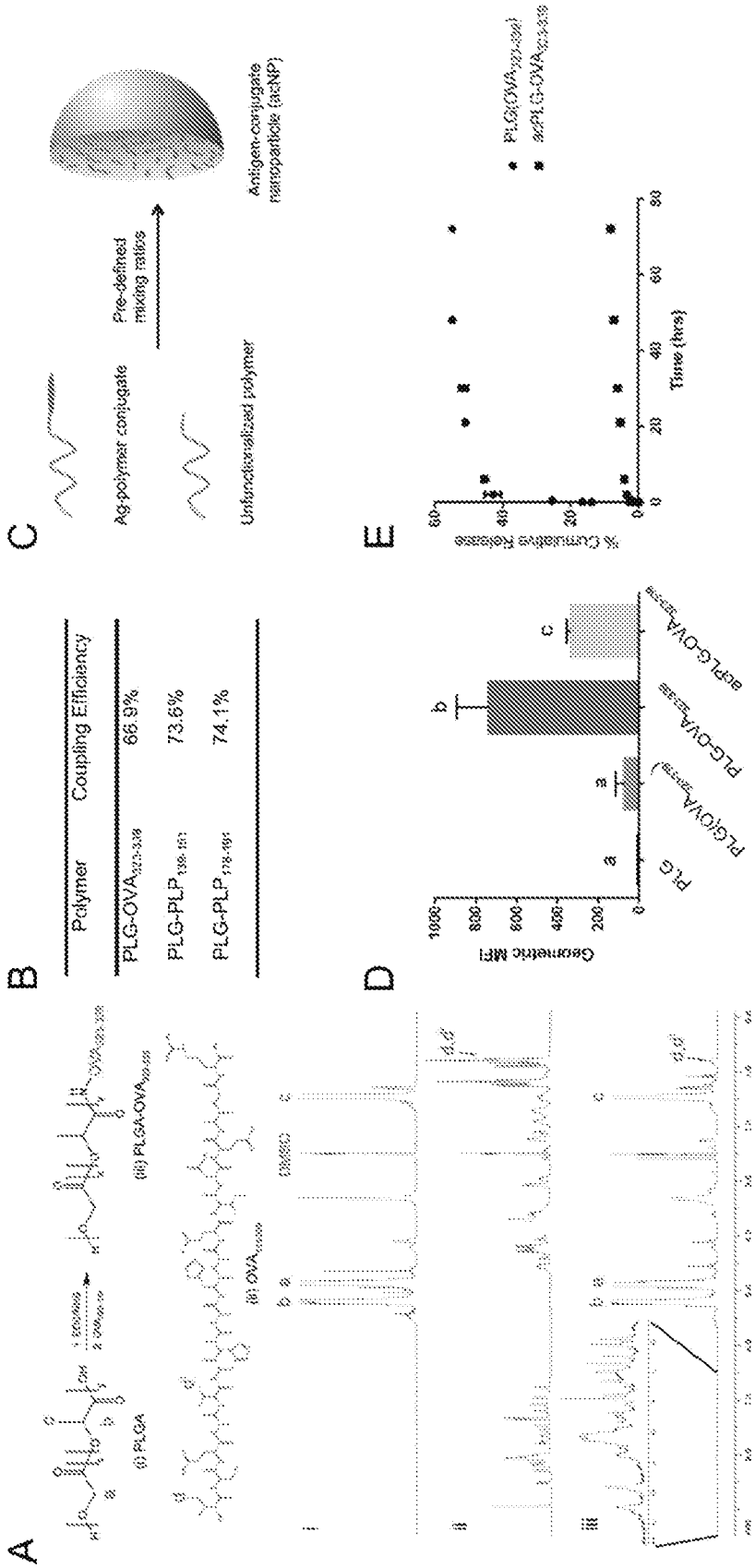

A
B
C
D
E
Polymer
Coupling Efficiency
PLG-OVA323-339
66.9%
PLG-PLP139-151
73.6%
PLG-PLP178-191
74.1%
Ag-polymer conjugate
Pre-defined mixing ratios
Unfunctionalized polymer
Antigen-conjugate nanoparticle (acNP)
Geometric MFI
Time (hrs)
% Cumulative Release

FIG. 11

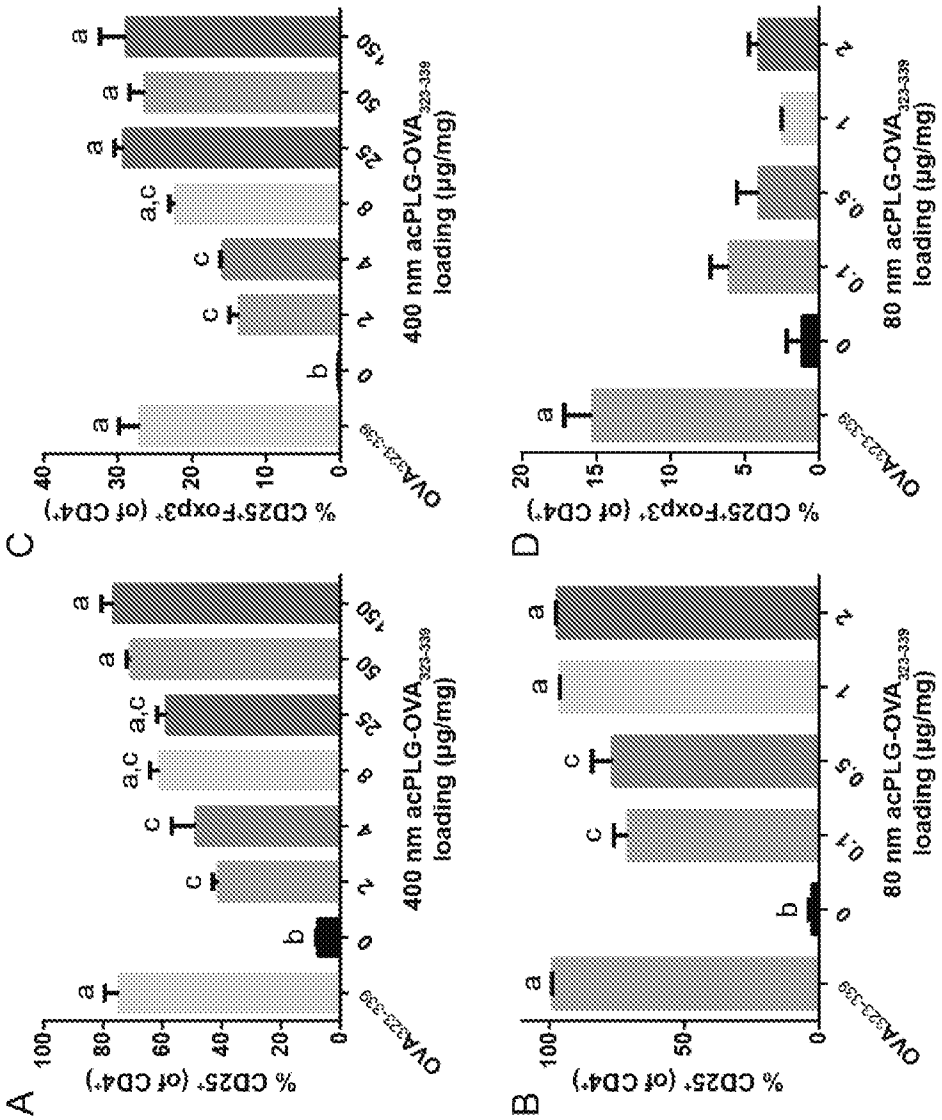

A
% CD25+ (of CD4+)
OVA323-339
400 nm acPLG-OVA323-339 loading (μg/mg)
B
% CD25+ (of CD4+)
OVA323-339
80 nm acPLG-OVA323-339 loading (μg/mg)
C
% CD25+Foxp3+ (of CD4+)
OVA323-339
400 nm acPLG-OVA323-339 loading (μg/mg)
D
% CD25+Foxp3+ (of CD4+)
OVA323-339
80 nm acPLG-OVA323-339 loading (μg/mg)

FIG. 12

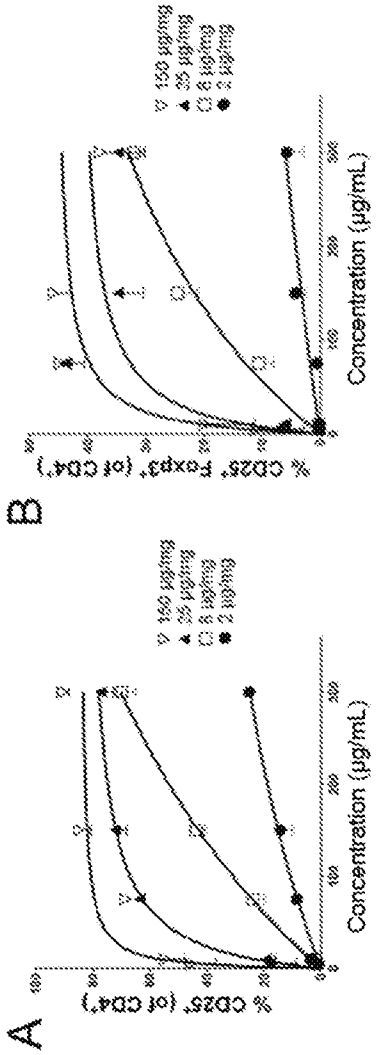

A
B
% CD25+ Foxp3+ (of CD4+)
Concentration (µg/mL)
150 µg/mg
35 µg/mg
6 µg/mg
2 µg/mg

FIG. 13

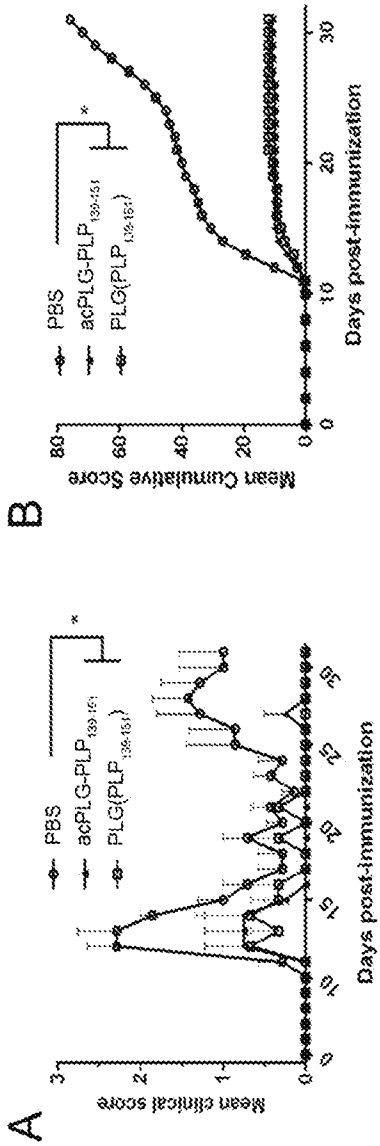

A
Mean clinical score
Days post-immunization
PBS
acPLG-PLP
PLG(PLP
*
B
Mean Cumulative Score
Days post-immunization
PBS
acPLG-PLP
PLG(PLP
*

FIG. 14

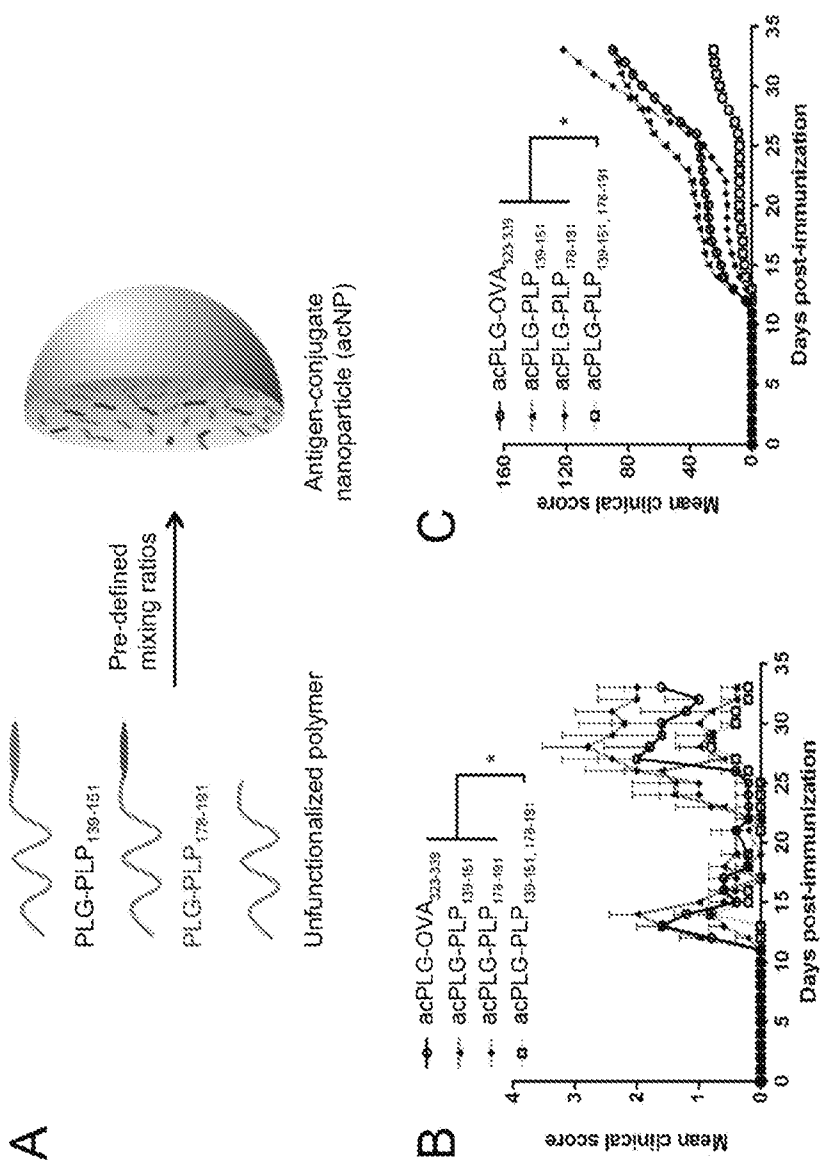

A
PLG-PLP139-151
PLG-PLP178-191
Pre-defined mixing ratios
Unfunctionalized polymer
Antigen-conjugate nanoparticle (acNP)
B
acPLG-OVA323-339
acPLG-PLP139-151
acPLG-PLP178-191
acPLG-PLP139-151, 178-191
Mean clinical score
Days post-immunization
C
acPLG-OVA323-339
acPLG-PLP139-151
acPLG-PLP178-191
acPLG-PLP139-151, 178-191
Mean clinical score
Days post-immunization

FIG. 15

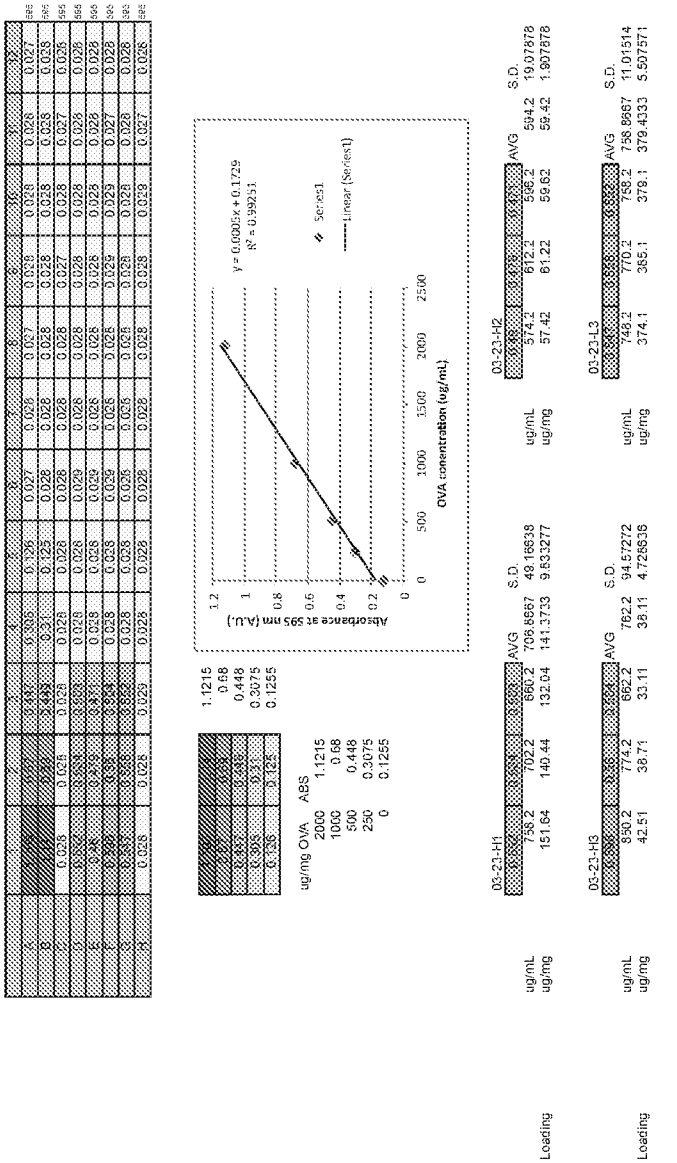

Results
1.2
1
0.8
0.6
0.4
0.2
0
Absorbance at 595 nm (A.U.)
y = 0.0005x + 0.1729
R² = 0.99231
Series1
Linear (Series1)
0
500
1000
1500
2000
2500
OVA concentration (ug/mL)
ug/mL OVA ABS
2000 1.1215
1000 0.68
500 0.448
250 0.3075
0 0.1255
03-23-H1
03-23-H2
03-23-H3
03-23-L3
Loading
ug/mL
ug/mg
AVG
S.D.

FIG. 16

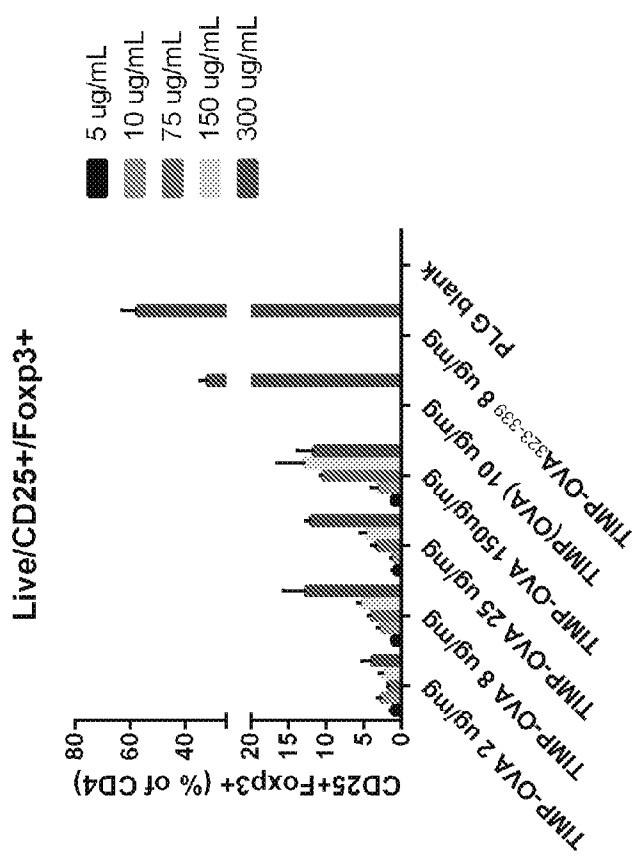

Live/CD25+/Foxp3+
5 ug/mL
10 ug/mL
75 ug/mL
150 ug/mL
300 ug/mL
CD25+Foxp3+ (% of CD4)
80
60
40
20
15
10
5
0
PLG blank
TIMP-OVA323-339 8 ug/mg
TIMP(OVA) 10 ug/mg
TIMP-OVA 150ug/mg
TIMP-OVA 25 ug/mg
TIMP-OVA 8 ug/mg
TIMP-OVA 2 ug/mg

FIG. 17

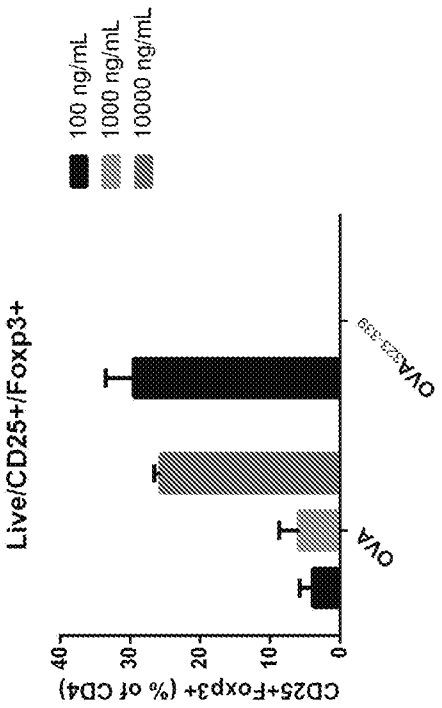

Live/CD25+/Foxp3+
100 ng/mL
1000 ng/mL
10000 ng/mL
CD25+Foxp3+ (% of CD4)
0
10
20
30
40
OVA
OVA323-339

FIG. 18

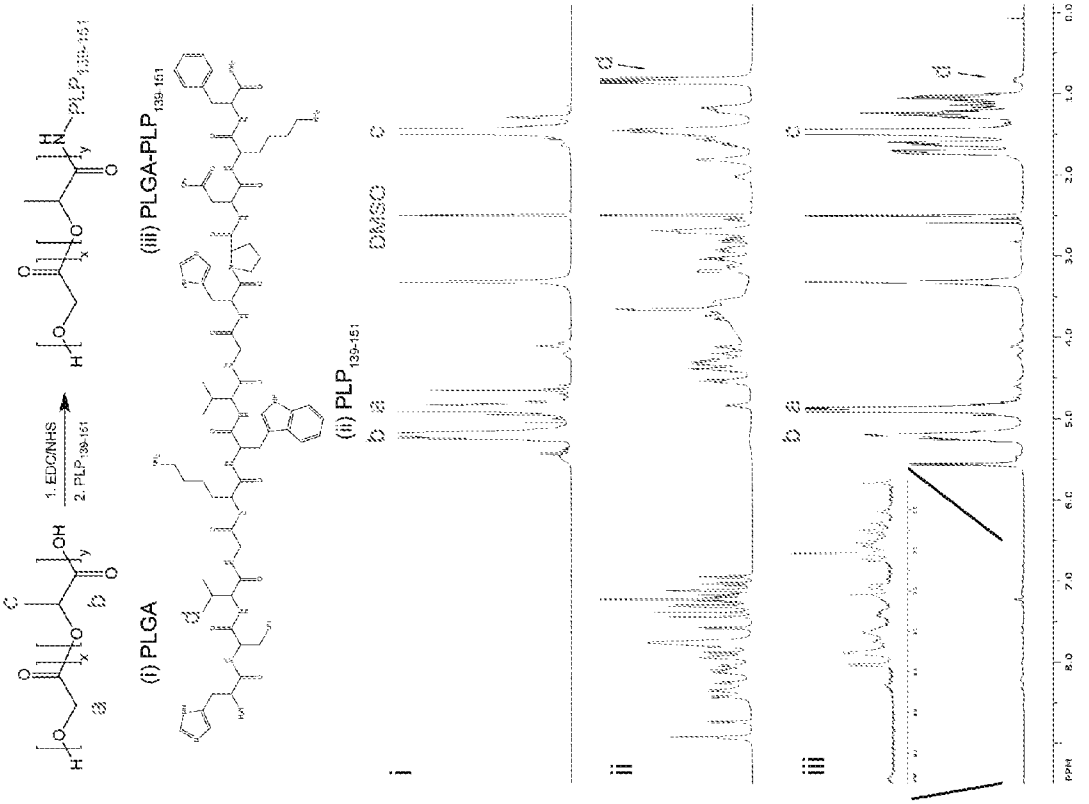

(i) PLGA
1. EDC/NHS
2. PLP139-151
(iii) PLGA-PLP139-151
(ii) PLP139-151
DMSO
i
ii
iii
PPM

Fig. 19

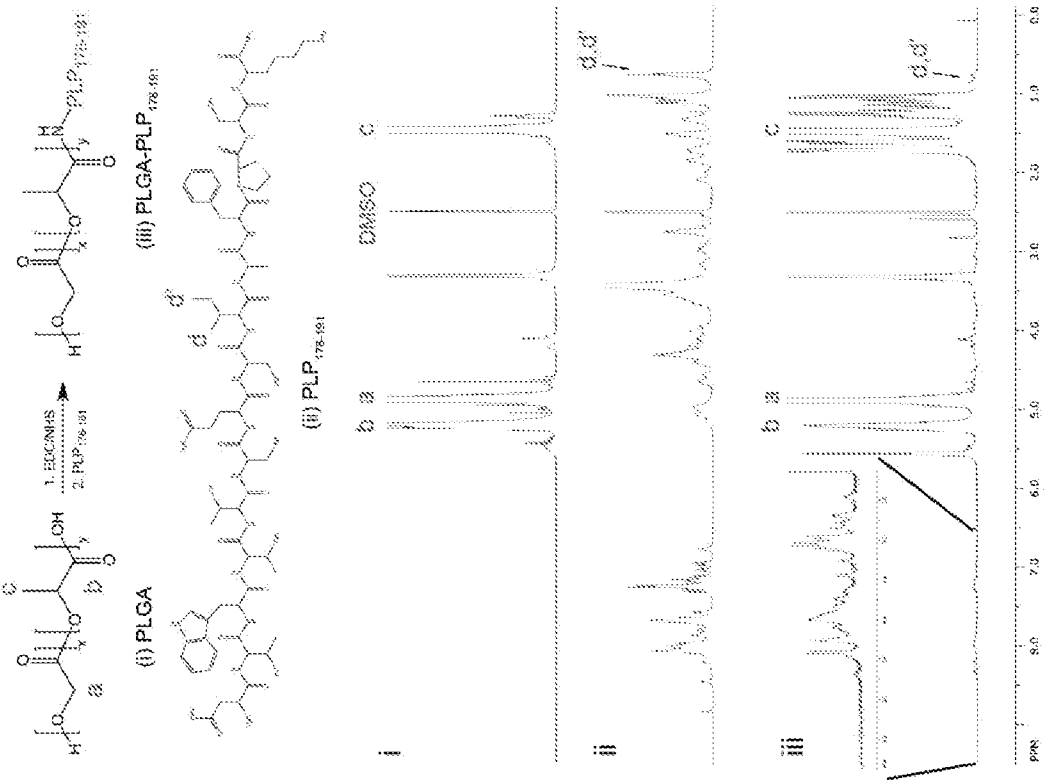

(i) PLGA
1. EDC/NHS
2. PLP178-191
(iii) PLGA-PLP178-191
(ii) PLP178-191
DMSO
i
ii
iii
PPM

FIG. 20

SEQUENCE LISTING

<110> Cour Pharmaceuticals Development Company

<120> Covalent Polymer-Antigen Conjugated Particles Particles

<130> COUR-011/01US

<160> 5140

<170> PatentIn version 3.5

<210> 1
<211> 21
<212> PRT
<213> Mus musculus

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Met Glu Val Gly Trp Tyr Arg Ser Pro Phe Ser Arg Val Val His Leu
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Tyr Arg Asn Gly Lys
20

<210> 2
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2

Ala Ser Phe Asp Lys Ala Lys Leu Lys
1 5

<210> 3
<211> 14
<212> PRT
<213> Oryctolagus cuniculus

<400> 3

Ala Ser Gln Lys Arg Pro Ser Gln Arg His Gly Ser Lys Tyr
1 5 10

<210> 4
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4

Ala Ser Gln Lys Arg Pro Ser Gln Arg His Gly Ser Lys Tyr Leu Ala
1 5 10 15

Thr Ala Ser Thr
20

<210> 5
<211> 20
<212> PRT
<213> Homo sapiens

<400> 5

Ala Thr Gly Leu Cys Phe Phe Gly Val Ala Leu Phe Cys Gly Cys Gly
1 5 10 15

His Glu Ala Leu
20

<210> 6
<211> 20
<212> PRT
<213> Homo sapiens

<400> 6

Ala Val Pro Val Tyr Ile Tyr Phe Asn Thr Trp Thr Thr Cys Gln Ser
1 5 10 15

Ile Ala Phe Pro
20

<210> 7
<211> 9
<212> PRT
<213> Human herpesvirus

<400> 7

Cys Leu Gly Gly Leu Leu Thr Met Val
1 5

<210> 8
<211> 9
<212> PRT
<213> Human herpesvirus

<400> 8

Cys Arg Val Leu Cys Cys Tyr Val Leu
1 5

<210> 9
<211> 9
<212> PRT
<213> Homo sapiens

<400> 9

Asp Ala Lys Ile Arg Ile Phe Asp Leu
1 5

<210> 10
<211> 18
<212> PRT
<213> Homo sapiens

<400> 10

Asp Thr Pro Tyr Leu Asp Ile Thr Tyr His Phe Val Met Gln Arg Leu
1 5 10 15

Pro Leu

<210> 11
<211> 15
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 11

Glu Asn Pro Val Val Ala Phe Phe Lys Asn Ile Val Thr Pro Arg
1 5 10 15

<210> 12
<211> 15
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 12

Glu Asn Pro Val Val Asp Phe Phe Lys Asn Ile Val Thr Pro Arg
1 5 10 15

<210> 13
<211> 15
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 13

Glu Asn Pro Val Val His Phe Phe Ala Asn Ile Val Thr Pro Arg
1 5 10 15

<210> 14
<211> 17
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 14

Glu Asn Pro Val Val His Phe Phe Ala Asn Ile Val Thr Pro Arg Thr
1 5 10 15

Pro

<210> 15
<211> 15
<212> PRT
<213> Homo sapiens

<400> 15

Glu Asn Pro Val Val His Phe Phe Lys Asn Ile Val Thr Pro Arg
1 5 10 15

<210> 16
<211> 17
<212> PRT
<213> Homo sapiens

<400> 16

Glu Asn Pro Val Val His Phe Phe Lys Asn Ile Val Thr Pro Arg Thr
1 5 10 15

Pro

<210> 17
<211> 20
<212> PRT
<213> Homo sapiens

<400> 17

Phe Gly Asp Tyr Lys Thr Thr Ile Cys Gly Lys Gly Leu Ser Ala Thr
1 5 10 15

Val Thr Gly Gly
20

<210> 18
<211> 9
<212> PRT
<213> Homo sapiens

<400> 18

Phe Leu Tyr Gly Ala Leu Leu Leu Ala
1 5

<210> 19
<211> 21
<212> PRT
<213> Homo sapiens

<400> 19

Phe Tyr Tyr Thr Thr Gly Ala Val Arg Gln Ile Phe Gly Asp Tyr Lys
1 5 10 15

Thr Thr Ile Cys Gly
20

<210> 20
<211> 24
<212> PRT
<213> Human herpesvirus

<400> 20

Gly Gly Asp Asn His Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly
1 5 10 15

Gly Gly Arg Pro Gly Ala Pro Gly
20

<210> 21
<211> 9
<212> PRT
<213> Human herpesvirus

<400> 21

Gly Leu Cys Thr Leu Val Ala Met Leu
1 5

<210> 22
<211> 13
<212> PRT
<213> Mus musculus

<400> 22

His Cys Leu Gly Lys Trp Leu Gly His Pro Asp Lys Phe
1 5 10

<210> 23
<211> 18
<212> PRT
<213> Mus musculus

<400> 23

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

Arg Arg

<210> 24
<211> 15
<212> PRT
<213> Homo sapiens

<400> 24

Ile Thr Arg Glu Glu Lys Pro Ala Val Thr Ala Ala Pro Lys Lys
1 5 10 15

<210> 25
<211> 13
<212> PRT
<213> Homo sapiens

<400> 25

Ile Val Thr Pro Arg Thr Pro Pro Pro Ser Gln Gly Lys
1 5 10

<210> 26
<211> 20
<212> PRT
<213> Homo sapiens

<400> 26

Lys Gly Leu Ser Ala Thr Val Thr Gly Gly Gln Lys Gly Arg Gly Tyr
1 5 10 15

Arg Gly Gln His
20

<210> 27
<211> 14
<212> PRT
<213> Homo sapiens

<400> 27

Lys Ile Phe Lys Leu Gly Gly Arg Asp Ser Arg Ser Gly Ser
1 5 10

<210> 28
<211> 20
<212> PRT
<213> Homo sapiens

<400> 28

Leu Phe Cys Gly Cys Gly His Glu Ala Leu Thr Gly Thr Glu Lys Leu
1 5 10 15

Ile Glu Thr Tyr
            20

<210> 29
<211> 10
<212> PRT
<213> Human herpesvirus

<400> 29

Leu Leu Asp Phe Val Arg Phe Met Gly Val
1   5   10

<210> 30
<211> 9
<212> PRT
<213> Human herpesvirus

<400> 30

Leu Leu Trp Thr Leu Val Val Leu Leu
1   5

<210> 31
<211> 20
<212> PRT
<213> Homo sapiens

<400> 31

Leu Pro Arg His Arg Asp Thr Gly Ile Leu Asp Ser Ile Gly Arg Phe
1   5   10   15

Phe Gly Gly Asp
            20

<210> 32
<211> 20
<212> PRT
<213> Homo sapiens

<400> 32

Leu Val Gly Ala Pro Phe Ala Ser Leu Val Ala Thr Gly Leu Cys Phe
1   5   10   15

Phe Gly Val Ala
            20

<210> 33
<211> 20
<212> PRT
<213> Homo sapiens

<400> 33

Leu Tyr Gly Ala Leu Leu Leu Ala Glu Gly Phe Tyr Thr Thr Gly Ala
1 5 10 15

Val Arg Gln Ile
20

<210> 34
<211> 19
<212> PRT
<213> Homo sapiens

<400> 34

Met Ala Ala Thr Tyr Asn Phe Ala Val Leu Lys Leu Met Gly Arg Phe
1 5 10 15

Thr Lys Phe

<210> 35
<211> 13
<212> PRT
<213> Human herpesvirus

<400> 35

Met Asp Arg Pro Arg Thr Pro Pro Pro Ser Tyr Ser Glu
1 5 10

<210> 36
<211> 9
<212> PRT
<213> Human herpesvirus

<400> 36

Asn Leu Val Pro Met Val Ala Thr Val
1 5

<210> 37
<211> 20
<212> PRT
<213> Mus musculus

<400> 37

Asn Pro Val Val His Phe Phe Lys Asn Ile Val Thr Pro Arg Thr Pro
1 5 10 15

Pro Pro Ser Gln
20

<210> 38

<211> 14
<212> PRT
<213> Mus musculus

<400> 38

Asn Thr Trp Thr Thr Cys Gln Ser Ile Ala Phe Pro Ser Lys
1 5 10

<210> 39
<211> 20
<212> PRT
<213> Homo sapiens

<400> 39

Gln Lys Gly Arg Gly Ser Arg Gly Gln His Gln Ala His Ser Leu Glu
1 5 10 15

Arg Val Cys His
20

<210> 40
<211> 8
<212> PRT
<213> Human herpesvirus

<400> 40

Arg Ala Lys Phe Lys Gln Leu Leu
1 5

<210> 41
<211> 9
<212> PRT
<213> Human herpesvirus

<400> 41

Arg Pro Pro Ile Phe Ile Arg Arg Leu
1 5

<210> 42
<211> 20
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<213> Homo sapiens

<400> 42

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

Tyr Gly Val Leu
20

<210> 43

<211> 9
<212> PRT
<213> Homo sapiens

<400> 43

Ser Leu Ser Arg Phe Ser Trp Gly Ala
1 5

<210> 44
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<212> PRT
<213> Human herpesvirus

<400> 44

Ser Val Arg Asp Arg Leu Ala Arg Leu
1 5

<210> 45
<211> 12
<212> PRT
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<220>
<223> epitope involved in multiple sclerosis

<400> 45

Ser Val Ser Val Gly Met Lys Pro Ser Pro Arg Pro
1 5 10

<210> 46
<211> 15
<212> PRT
<213> Human herpesvirus

<400> 46

Thr Gly Gly Val Tyr His Phe Val Lys Lys His Val His Glu Ser
1 5 10 15

<210> 47
<211> 20
<212> PRT
<213> Homo sapiens

<400> 47

Thr Gly Thr Glu Lys Leu Ile Glu Thr Tyr Phe Ser Lys Asn Tyr Gln
1 5 10 15

Asp Tyr Glu Tyr
20

<210> 48
<211> 10

<212> PRT
<213> Human herpesvirus

<400> 48

Thr Pro Arg Val Thr Gly Gly Gly Ala Met
1 5 10

<210> 49
<211> 20
<212> PRT
<213> Homo sapiens

<400> 49

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

Asp Ser Arg Ser
20

<210> 50
<211> 13
<212> PRT
<213> Cavia porcellus

<400> 50

Val His Phe Phe Lys Asn Ile Val Thr Pro Arg Thr Pro
1 5 10

<210> 51
<211> 9
<212> PRT
<213> Homo sapiens

<400> 51

Val Met Ala Pro Arg Thr Leu Val Leu
1 5

<210> 52
<211> 20
<212> PRT
<213> Mus musculus

<400> 52

Val Thr Pro Arg Thr Pro Pro Pro Ser Gln Gly Lys Gly Arg Gly Leu
1 5 10 15

Ser Leu Ser Arg
20

<210> 53
<211> 9

<212> PRT
<213> Homo sapiens

<400> 53

Val Val His Phe Phe Lys Asn Ile Val
1 5

<210> 54
<211> 20
<212> PRT
<213> Homo sapiens

<400> 54

Trp Thr Thr Cys Gln Ser Ile Ala Phe Pro Ser Lys Thr Ser Ala Ser
1 5 10 15

Ile Gly Ser Leu
20

<210> 55
<211> 23
<212> PRT
<213> Human T-cell lymphotrophic virus

<400> 55

Ile Gln Ala Ile Val Ser Ser Pro Cys His Asn Ser Leu Ile Leu Pro
1 5 10 15

Pro Phe Ser Leu Ser Pro Val
20

<210> 56
<211> 24
<212> PRT
<213> Human T-cell lymphotrophic virus

<400> 56

Leu Pro Pro Thr Ala Pro Pro Leu Leu Pro His Ser Asn Leu Asp His
1 5 10 15

Ile Leu Glu Pro Ser Ile Pro Trp
20

<210> 57
<211> 20
<212> PRT
<213> Human T-cell lymphotrophic virus

<400> 57

Pro Pro Pro Tyr Val Glu Pro Thr Ala Pro Gln Val Leu Pro Val Met
1 5 10 15

His Pro His Gly
20

<210> 58
<211> 23
<212> PRT
<213> Human T-cell lymphotrophic virus

<400> 58

Gln Gly Gly Leu Cys Lys Ala Leu Gln Glu Gln Cys Arg Phe Pro Asn
1 5 10 15

Ile Thr Asn Ser His Val Pro
20

<210> 59
<211> 20
<212> PRT
<213> Human T-cell lymphotrophic virus

<400> 59

Arg Ala Ser Leu Ser Thr Trp His Val Leu Tyr Ser Pro Asn Val Ser
1 5 10 15

Val Pro Ser Ser
20

<210> 60
<211> 10
<212> PRT
<213> Homo sapiens

<400> 60

Phe Phe Lys Asn Ile Val Thr Pro Arg Thr
1 5 10

<210> 61
<211> 9
<212> PRT
<213> Homo sapiens

<400> 61

Phe Lys Asn Ile Val Thr Pro Arg Thr
1 5

<210> 62
<211> 11
<212> PRT
<213> Cavia porcellus

<400> 62

His Phe Phe Lys Asn Ile Val Thr Pro Arg Thr
1 5 10

<210> 63
<211> 15
<212> PRT
<213> Homo sapiens

<400> 63

Lys Gly Phe Lys Gly Val Asp Ala Gln Gly Thr Leu Ser Lys Ile
1 5 10 15

<210> 64
<211> 13
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 64

Val His Phe Phe Lys Asn Ile Val Thr Ala Arg Thr Pro
1 5 10

<210> 65
<211> 13
<212> PRT
<213> Homo sapiens

<400> 65

Val Val His Phe Phe Lys Asn Ile Val Thr Pro Arg Thr
1 5 10

<210> 66
<211> 9
<212> PRT
<213> Human herpesvirus

<400> 66

Ser Gln Ala Pro Leu Pro Cys Val Leu
1 5

<210> 67
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 67

His Thr Gln Pro Tyr Ala Tyr Glu Ala Arg Asp His
1 5 10

<210> 68
<211> 15
<212> PRT
<213> Bos taurus

<400> 68

Phe Lys Ala Asp Glu Lys Lys Phe Trp Gly Lys Tyr Leu Tyr Glu
1 5 10 15

<210> 69
<211> 16
<212> PRT
<213> Homo sapiens

<400> 69

His Cys Leu Gly Lys Trp Leu Gly His Pro Asp Lys Phe Val Gly Ile
1 5 10 15

<210> 70
<211> 14
<212> PRT
<213> Mus musculus

<400> 70

Lys Thr Thr Ile Cys Gly Lys Gly Leu Ser Ala Thr Val Thr
1 5 10

<210> 71
<211> 17
<212> PRT
<213> Homo sapiens

<400> 71

Val Asp Asp Thr Gln Phe Val Arg Phe Asp Ser Asp Ala Ala Ser Pro
1 5 10 15

Arg

<210> 72
<211> 22
<212> PRT
<213> Mus musculus

<400> 72

Glu Lys Leu Ile Glu Thr Tyr Phe Ser Lys Asn Tyr Gln Asp Tyr Glu
1 5 10 15

Tyr Leu Ile Asn Val Ile
20

<210> 73
<211> 9
<212> PRT
<213> Mus musculus

<400> 73

Ala Ser Gln Lys Arg Pro Ser Gln Arg
1 5

<210> 74
<211> 15
<212> PRT
<213> Homo sapiens

<400> 74

Asp Glu Asn Pro Val Val His Phe Phe Lys Asn Ile Val Thr Pro
1 5 10 15

<210> 75
<211> 19
<212> PRT
<213> Homo sapiens

<400> 75

Asp Glu Asn Pro Val Val His Phe Phe Lys Asn Ile Val Thr Pro Arg
1 5 10 15

Thr Pro Pro

<210> 76
<211> 26
<212> PRT
<213> Homo sapiens

<400> 76

Phe Lys Gly Val Asp Ala Gln Gly Thr Leu Ser Lys Ile Phe Lys Leu
1 5 10 15

Gly Gly Arg Asp Ser Arg Ser Gly Ser Pro
20 25

<210> 77
<211> 18
<212> PRT
<213> Homo sapiens

<400> 77

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Gly Thr Glu Lys Leu Ile Glu Thr Tyr Phe Ser Lys Asn Tyr Gln Asp
1               5                   10                  15


Tyr Glu



<210>  78
<211>  16
<212>  PRT
<213>  Homo sapiens

<400>  78

Gln Ser Ile Ala Phe Pro Ser Lys Thr Ser Ala Ser Ile Gly Ser Leu
1               5                   10                  15


<210>  79
<211>  25
<212>  PRT
<213>  Homo sapiens

<400>  79

Ala Gln Gly Thr Leu Ser Lys Ile Phe Lys Leu Gly Gly Arg Asp Ser
1               5                   10                  15


Arg Ser Gly Ser Pro Met Ala Arg Arg
            20                  25


<210>  80
<211>  25
<212>  PRT
<213>  Homo sapiens

<400>  80

Ala Ser Asp Tyr Lys Ser Ala His Lys Gly Leu Lys Gly Val Asp Ala
1               5                   10                  15


Gln Gly Thr Leu Ser Lys Ile Phe Lys
            20                  25


<210>  81
<211>  31
<212>  PRT
<213>  Homo sapiens

<400>  81

Glu Val Gly Glu Leu Ser Arg Gly Lys Leu Tyr Ser Leu Gly Asn Gly
1               5                   10                  15


Arg Trp Met Leu Thr Leu Ala Lys Asn Met Glu Val Arg Ala Ile
            20                  25                  30
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<210> 82
<211> 18
<212> PRT
<213> Homo sapiens

<400> 82

Gly Phe Tyr Thr Thr Gly Ala Val Arg Gln Ile Phe Gly Asp Tyr Lys
1 5 10 15

Thr Thr

<210> 83
<211> 33
<212> PRT
<213> Homo sapiens

<400> 83

Gly Asn Gly Arg Trp Met Leu Thr Leu Ala Lys Asn Met Glu Val Arg
1 5 10 15

Ala Ile Phe Thr Gly Tyr Tyr Gly Lys Gly Lys Pro Val Pro Thr Gln
20 25 30

Gly

<210> 84
<211> 20
<212> PRT
<213> Homo sapiens

<400> 84

Gly Gln Phe Arg Val Ile Gly Pro Arg His Pro Ile Arg Ala Leu Val
1 5 10 15

Gly Asp Glu Val
20

<210> 85
<211> 20
<212> PRT
<213> Homo sapiens

<400> 85

His His Pro Ala Arg Thr Ala His Tyr Gly Ser Leu Pro Gln Lys Ser
1 5 10 15

His Gly Arg Thr
20

<210> 86
<211> 20
<212> PRT
<213> Homo sapiens

<400> 86

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

Arg Gly Leu Ser
20

<210> 87
<211> 20
<212> PRT
<213> Homo sapiens

<400> 87

Lys Tyr Leu Ala Thr Ala Ser Thr Met Asp His Ala Arg His Gly Phe
1 5 10 15

Leu Pro Arg His
20

<210> 88
<211> 19
<212> PRT
<213> Homo sapiens

<400> 88

Leu Ser Arg Phe Ser Trp Gly Ala Glu Gly Gln Arg Pro Gly Phe Gly
1 5 10 15

Tyr Gly Gly

<210> 89
<211> 21
<212> PRT
<213> Homo sapiens

<400> 89

Met Glu Val Gly Trp Tyr Arg Pro Pro Phe Ser Arg Val Val His Leu
1 5 10 15

Tyr Arg Asn Gly Lys
20

<210> 90

<211> 20
<212> PRT
<213> Homo sapiens

<400> 90

Asn Thr Trp Thr Thr Cys Gln Ser Ile Ala Phe Pro Ser Lys Thr Ser
1 5 10 15

Ala Ser Ile Gly
20

<210> 91
<211> 20
<212> PRT
<213> Homo sapiens

<400> 91

Pro Ile Arg Ala Leu Val Gly Asp Glu Val Glu Leu Pro Cys Arg Ile
1 5 10 15

Ser Pro Gly Lys
20

<210> 92
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 92

Gln Lys Ser Gln Arg Ser Gln Ala Glu Asn Pro Val
1 5 10

<210> 93
<211> 12
<212> PRT
<213> Cavia porcellus

<400> 93

Gln Lys Ser Gln Arg Ser Gln Asp Glu Asn Pro Val
1 5 10

<210> 94
<211> 20
<212> PRT
<213> Homo sapiens

<400> 94

Gln Arg Pro Gly Phe Gly Tyr Gly Gly Arg Ala Ser Asp Tyr Lys Ser
1 5 10 15

Ala His Lys Gly
20

<210> 95
<211> 20
<212> PRT
<213> Homo sapiens

<400> 95

Arg His Arg Asp Thr Gly Ile Leu Asp Ser Ile Gly Arg Phe Phe Gly
1 5 10 15

Gly Asp Arg Gly
20

<210> 96
<211> 20
<212> PRT
<213> Homo sapiens

<400> 96

Ser Lys Ile Phe Lys Leu Gly Gly Arg Asp Ser Arg Ser Gly Ser Pro
1 5 10 15

Met Ala Arg Arg
20

<210> 97
<211> 21
<212> PRT
<213> Homo sapiens

<400> 97

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

Tyr Gly Val Leu Pro
20

<210> 98
<211> 21
<212> PRT
<213> Homo sapiens

<400> 98

Thr Gly Thr Glu Lys Leu Ile Glu Thr Tyr Phe Ser Lys Asn Tyr Gln
1 5 10 15

Asp Tyr Glu Tyr Leu

20

<210> 99
<211> 13
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 99

Val His Phe Phe Arg Asn Ile Val Thr Ala Arg Thr Pro
1 5 10

<210> 100
<211> 13
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 100

Val His Phe Phe Arg Asn Ile Val Thr Ala Arg Thr Pro
1 5 10

<210> 101
<211> 20
<212> PRT
<213> Homo sapiens

<400> 101

Val Val His Phe Phe Lys Asn Ile Val Thr Pro Arg Thr Pro Pro Pro
1 5 10 15

Ser Gln Gly Lys
20

<210> 102
<211> 21
<212> PRT
<213> Homo sapiens

<400> 102

Ala Ser Gln Lys Arg Pro Ser Gln Arg His Gly Ser Lys Tyr Leu Ala
1 5 10 15

Thr Ala Ser Thr Met
20

<210> 103
<211> 44

<212> PRT
<213> Homo sapiens

<400> 103

Ala Ser Gln Lys Arg Pro Ser Gln Arg His Gly Ser Lys Tyr Leu Ala
1 5 10 15

Thr Ala Ser Thr Met Asp His Ala Arg His Gly Phe Leu Pro Arg His
20 25 30

Arg Asp Thr Gly Ile Leu Asp Ser Ile Gly Arg Phe
35 40

<210> 104
<211> 21
<212> PRT
<213> Homo sapiens

<400> 104

Ala Ser Thr Met Asp His Ala Arg His Gly Phe Leu Pro Arg His Arg
1 5 10 15

Asp Thr Gly Ile Leu
20

<210> 105
<211> 23
<212> PRT
<213> Homo sapiens

<400> 105

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

Gly Leu Ser Ala Thr Val Thr
20

<210> 106
<211> 19
<212> PRT
<213> Homo sapiens

<400> 106

Glu Asn Pro Val Val His Phe Phe Lys Asn Ile Val Thr Pro Arg Thr
1 5 10 15

Pro Pro Pro

<210> 107

<211> 18
<212> PRT
<213> Homo sapiens

<400> 107

Gly Phe Tyr Thr Thr Gly Ala Tyr Arg Gln Ile Phe Gly Asp Tyr Leu
1 5 10 15

Thr Thr

<210> 108
<211> 20
<212> PRT
<213> Homo sapiens

<400> 108

Gly Arg Ala Ser Asp Tyr Lys Ser Ala His Lys Gly Phe Lys Gly Val
1 5 10 15

Asp Ala Gln Gly
20

<210> 109
<211> 25
<212> PRT
<213> Homo sapiens

<400> 109

Gly Val Leu Pro Trp Asn Ala Phe Pro Gly Lys Val Cys Gly Ser Asn
1 5 10 15

Leu Leu Ser Ile Cys Lys Thr Ala Glu
20 25

<210> 110
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 110

His Leu Ile Leu Ala Pro Ser Ile Arg His Ala Pro
1 5 10

<210> 111
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 111

His Leu Val Met Ala Pro Ser Val Ala Arg Gly Leu
1 5 10

<210> 112
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 112

His Val Gln Leu Ala Pro Pro Ile Ala Leu Arg His
1 5 10

<210> 113
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 113

His Val Val Leu Ala Pro Asn Val Gln Ser Pro Leu
1 5 10

<210> 114
<211> 24
<212> PRT
<213> Homo sapiens

<400> 114

His Tyr Gly Ser Leu Pro Gln Lys Ser His Gly Arg Thr Gln Asp Glu
1 5 10 15

Asn Pro Val Val His Phe Phe Lys
20

<210> 115
<211> 14
<212> PRT
<213> Homo sapiens

<400> 115

Lys Lys Gln Ser Lys Pro Val Thr Thr Pro Glu Glu Ile Ala
1 5 10

<210> 116
<211> 33
<212> PRT
<213> Homo sapiens

<400> 116

Lys Leu Ile Glu Thr Tyr Phe Ser Lys Asn Tyr Gln Asp Tyr Glu Tyr
1 5 10 15

Leu Ile Asn Val Ile His Ala Phe Gln Tyr Val Ile Tyr Gly Thr Ala
20 25 30

Ser

<210> 117
<211> 30
<212> PRT
<213> Homo sapiens

<400> 117

Leu Ala Thr Ala Ser Thr Met Asp His Ala Arg His Gly Phe Leu Pro
1 5 10 15

Arg His Arg Asp Thr Gly Ile Leu Asp Ser Ile Gly Arg Phe
20 25 30

<210> 118
<211> 23
<212> PRT
<213> Homo sapiens

<400> 118

Leu Thr Phe Met Ile Ala Ala Thr Tyr Asn Phe Ala Val Leu Lys Leu
1 5 10 15

Met Gly Arg Gly Thr Lys Phe
20

<210> 119
<211> 20
<212> PRT
<213> Bos taurus

<400> 119

Met Ile Ala Ala Thr Tyr Asn Phe Ala Val Leu Lys Leu Met Gly Arg
1 5 10 15

Gly Thr Lys Phe
20

<210> 120
<211> 21
<212> PRT
<213> Homo sapiens

<400> 120

Arg His Gly Ser Lys Tyr Leu Ala Thr Ala Ser Thr Met Asp His Ala
1 5 10 15

Arg His Gly Phe Leu
20

<210> 121
<211> 22
<212> PRT
<213> Homo sapiens

<400> 121

Ser Ile Ala Phe Pro Ser Lys Thr Ser Ala Ser Ile Gly Ser Leu Cys
1 5 10 15

Ala Asp Ala Arg Met Tyr
20

<210> 122
<211> 34
<212> PRT
<213> Homo sapiens

<400> 122

Thr Gly Gly Gln Lys Gly Arg Gly Ser Arg Gly Gln His Gln Ala His
1 5 10 15

Ser Leu Glu Arg Val Cys His Cys Leu Gly Lys Trp Leu Gly His Pro
20 25 30

Asp Lys

<210> 123
<211> 20
<212> PRT
<213> Bos taurus

<400> 123

Thr Thr Ile Cys Gly Lys Gly Leu Ser Ala Thr Val Thr Gly Gly Gln
1 5 10 15

Lys Gly Arg Gly
20

<210> 124
<211> 14
<212> PRT
<213> Homo sapiens

<400> 124

Val Val Thr Glu Ile Pro Lys Glu Glu Lys Asp Pro Gly Met
1 5 10

<210> 125
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 125

Trp His Ala Pro Gln Thr Pro Tyr Trp Ala Ser Met
1 5 10

<210> 126
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 126

Trp His Ile Pro Pro Asn Ile Gly Arg Thr Phe Ser
1 5 10

<210> 127
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 127

Trp His Gln Thr Tyr Thr Ser Ser Leu Trp Glu Ser
1 5 10

<210> 128
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 128

Trp His Thr Gln Pro Ala His Val Val Thr Pro Met
1 5 10

<210> 129
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 129

Trp His Thr Ser Asp Pro Leu Pro Pro Ala Gln Pro
1 5 10

<210> 130
<211> 26
<212> PRT
<213> Homo sapiens

<400> 130

Ala Leu Val Gly Asp Glu Val Glu Leu Pro Cys Arg Ile Ser Pro Gly
1 5 10 15

Lys Asn Ala Thr Gly Met Glu Leu Gly Trp
20 25

<210> 131
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 131

Ala Arg Trp Glu Leu Asn Leu
1 5

<210> 132
<211> 22
<212> PRT
<213> Homo sapiens

<400> 132

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

Gly Leu Ser Ala Thr Val
20

<210> 133
<211> 20
<212> PRT
<213> Homo sapiens

<400> 133

Asp Thr Gly Ile Leu Asp Ser Ile Gly Arg Phe Phe Gly Gly Asp Arg
1 5 10 15

Gly Ala Pro Lys
20

<210> 134
<211> 20
<212> PRT
<213> Homo sapiens

<400> 134

Glu Lys Asp Arg Phe Ser Val Asn Leu Asp Val Ser His Phe Ser Pro
1 5 10 15

Glu Glu Leu Lys
20

<210> 135
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 135

Glu Pro Leu Tyr Gly Pro Tyr
1 5

<210> 136
<211> 20
<212> PRT
<213> Homo sapiens

<400> 136

Phe Asp Thr Gly Leu Ser Glu Met Arg Leu Glu Lys Asp Arg Phe Ser
1 5 10 15

Val Asn Leu Asp
20

<210> 137
<211> 26
<212> PRT

<213> Homo sapiens

<400> 137

Gly Gln Phe Arg Val Ile Gly Pro Arg His Pro Ile Arg Ala Leu Val
1 5 10 15

Gly Asp Glu Val Glu Leu Pro Cys Arg Ile
20 25

<210> 138
<211> 20
<212> PRT
<213> Homo sapiens

<400> 138

Gly Ser Gly Lys Asp Ser His His Pro Ala Arg Thr Ala His Tyr Gly
1 5 10 15

Ser Leu Pro Gln
20

<210> 139
<211> 15
<212> PRT
<213> Homo sapiens

<400> 139

Gly Ser Leu Pro Gln Lys Ser His Gly Arg Thr Gln Asp Glu Asn
1 5 10 15

<210> 140
<211> 20
<212> PRT
<213> Homo sapiens

<400> 140

Gly Val Leu Thr Val Asn Gly Pro Arg Lys Gln Val Ser Gly Pro Glu
1 5 10 15

Arg Thr Ile Pro
20

<210> 141
<211> 23
<212> PRT
<213> Homo sapiens

<400> 141

Gly Trp Tyr Arg Pro Pro Phe Ser Arg Val Val His Leu Tyr Arg Asn
1 5 10 15

Gly Lys Asp Gln Asp Gly Asp
20

<210> 142
<211> 20
<212> PRT
<213> Homo sapiens

<400> 142

His Gly Phe Ile Ser Arg Glu Phe His Arg Lys Tyr Arg Ile Pro Ala
1 5 10 15

Asp Val Asp Pro
20

<210> 143
<211> 20
<212> PRT
<213> Homo sapiens

<400> 143

His Gly Lys His Glu Glu Arg Gln Asp Glu His Gly Phe Ile Ser Arg
1 5 10 15

Glu Phe His Arg
20

<210> 144
<211> 20
<212> PRT
<213> Homo sapiens

<400> 144

His Leu Leu Glu Ser Asp Leu Phe Pro Thr Ser Thr Ser Leu Ser Pro
1 5 10 15

Phe Tyr Leu Arg
20

<210> 145
<211> 25
<212> PRT
<213> Homo sapiens

<400> 145

Ile Gly Glu Gly Lys Val Thr Leu Arg Ile Arg Asn Val Arg Phe Ser
1 5 10 15

Asp Glu Gly Gly Phe Thr Cys Phe Phe
20 25

<210> 146
<211> 20
<212> PRT
<213> Homo sapiens

<400> 146

Lys Tyr Arg Ile Pro Ala Asp Val Asp Pro Leu Thr Ile Thr Ser Ser
1 5 10 15

Leu Ser Ser Asp
20

<210> 147
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 147

Leu Ala Thr Pro Asn Pro Ser
1 5

<210> 148
<211> 20
<212> PRT
<213> Homo sapiens

<400> 148

Leu Thr Ile Thr Ser Ser Leu Ser Ser Asp Gly Val Leu Thr Val Asn
1 5 10 15

Gly Pro Arg Lys
20

<210> 149
<211> 24
<212> PRT
<213> Homo sapiens

<400> 149

Leu Tyr Arg Asn Gly Lys Asp Gln Asp Gly Asp Ala Pro Glu Tyr Arg
1 5 10 15

Gly Arg Thr Glu Leu Leu Lys Asp
20

<210> 150
<211> 20

<212> PRT
<213> Homo sapiens

<400> 150

Met Asp Ile Ala Ile His His Pro Trp Ile Arg Arg Pro Phe Phe Pro
1 5 10 15

Phe His Ser Pro
20

<210> 151
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 151

Pro Glu Phe Ala Pro Trp Ala
1 5

<210> 152
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 152

Pro Glu Gln Pro Pro Ile His
1 5

<210> 153
<211> 25
<212> PRT
<213> Homo sapiens

<400> 153

Pro Glu Tyr Arg Gly Arg Thr Glu Leu Leu Lys Asp Ala Ile Gly Glu
1 5 10 15

Gly Lys Val Thr Leu Arg Ile Arg Asn
20 25

<210> 154
<211> 20
<212> PRT
<213> Homo sapiens

<400> 154

Pro Pro Ser Phe Leu Arg Ala Pro Ser Trp Phe Asp Thr Gly Leu Ser
1 5 10 15

Glu Met Arg Leu
20

<210> 155
<211> 20
<212> PRT
<213> Homo sapiens

<400> 155

Pro Val Val His Phe Phe Lys Asn Ile Val Thr Pro Arg Thr Pro Pro
1 5 10 15

Pro Ser Gln Gly
20

<210> 156
<211> 20
<212> PRT
<213> Homo sapiens

<400> 156

Gln Gly Lys Gly Arg Gly Leu Ser Leu Ser Arg Phe Ser Trp Gly Ala
1 5 10 15

Glu Gly Gln Arg
20

<210> 157
<211> 20
<212> PRT
<213> Homo sapiens

<400> 157

Gln Val Ser Gly Pro Glu Arg Thr Ile Pro Ile Thr Arg Glu Glu Lys
1 5 10 15

Pro Ala Val Thr
20

<210> 158
<211> 25
<212> PRT
<213> Homo sapiens

<400> 158

Arg Asp His Ser Tyr Gln Glu Glu Ala Ala Met Glu Leu Lys Val Glu
1 5 10 15

Asp Pro Phe Tyr Trp Val Ser Pro Gly
20 25

<210> 159
<211> 25
<212> PRT
<213> Homo sapiens

<400> 159

Arg Phe Ser Asp Glu Gly Gly Phe Thr Cys Phe Phe Arg Asp His Ser
1 5 10 15

Tyr Gln Glu Glu Ala Ala Met Glu Leu
20 25

<210> 160
<211> 20
<212> PRT
<213> Homo sapiens

<400> 160

Arg Arg Pro Phe Phe Pro Phe His Ser Pro Ser Arg Leu Phe Asp Gln
1 5 10 15

Phe Phe Gly Glu
20

<210> 161
<211> 24
<212> PRT
<213> Homo sapiens

<400> 161

Ser Pro Gly Lys Asn Ala Thr Gly Met Glu Leu Gly Trp Tyr Arg Pro
1 5 10 15

Pro Phe Ser Arg Val Val His Leu
20

<210> 162
<211> 20
<212> PRT
<213> Homo sapiens

<400> 162

Ser Arg Leu Phe Asp Gln Phe Phe Gly Glu His Leu Leu Glu Ser Asp
1 5 10 15

Leu Phe Pro Thr
20

<210> 163
<211> 20
<212> PRT
<213> Homo sapiens

<400> 163

Ser Thr Ser Leu Ser Pro Phe Tyr Leu Arg Pro Pro Ser Phe Leu Arg
1 5 10 15

Ala Pro Ser Trp
20

<210> 164
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 164

Ser Trp Tyr Ala Arg His Thr
1 5

<210> 165
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 165

Ser Trp Tyr Ala Arg His Tyr
1 5

<210> 166
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 166

Thr Ile Lys Asn Thr Phe Phe
1 5

<210> 167
<211> 14
<212> PRT
<213> Homo sapiens

<400> 167

Thr Leu Ser Lys Ile Phe Lys Leu Gly Gly Arg Asp Ser Arg
1 5 10

<210> 168
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 168

Thr Pro Thr Phe Met Tyr Phe
1 5

<210> 169
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 169

Thr Ser Pro Ser Val Ala Tyr
1 5

<210> 170
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 170

Thr Thr Pro Leu Thr Asn Leu
1 5

<210> 171
<211> 13
<212> PRT
<213> Homo sapiens

<400> 171

Val Asp Ala Gln Gly Thr Leu Ser Lys Ile Phe Lys Leu
1 5 10

<210> 172
<211> 7
<212> PRT

<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 172

Val Asp His Gln His Pro Ser
1 5

<210> 173
<211> 20
<212> PRT
<213> Homo sapiens

<400> 173

Val Lys Val Leu Gly Asp Val Ile Glu Val His Gly Lys His Glu Glu
1 5 10 15

Arg Gln Asp Glu
20

<210> 174
<211> 20
<212> PRT
<213> Homo sapiens

<400> 174

Val Ser His Phe Ser Pro Glu Glu Leu Lys Val Lys Val Leu Gly Asp
1 5 10 15

Val Ile Glu Val
20

<210> 175
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 175

Tyr Ala Gln Pro Ser Glu Arg
1 5

<210> 176
<211> 15
<212> PRT
<213> Homo sapiens

<400> 176

Ala Ala Ala Gln Met Pro Ala Tyr Gln Glu Leu Val Glu Glu Ala

1 5 10 15

<210> 177
<211> 26
<212> PRT
<213> Cavia porcellus

<400> 177

Ala Ala Arg Thr Thr His Tyr Gly Ser Leu Pro Gln Lys Ser Gln Arg
1 5 10 15

Ser Gln Asp Glu Asn Pro Val Val His Phe
20 25

<210> 178
<211> 15
<212> PRT
<213> Homo sapiens

<400> 178

Ala Gly Val Thr Leu Ile Ser Pro Phe Val Gly Arg Ile Leu Asp
1 5 10 15

<210> 179
<211> 19
<212> PRT
<213> Homo sapiens

<400> 179

Ala Arg Arg Lys Val Ala Met Ala Thr Thr Tyr Tyr Phe Asp Tyr Trp
1 5 10 15

Gly Gln Gly

<210> 180
<211> 20
<212> PRT
<213> Homo sapiens

<400> 180

Ala Arg Thr Ala His Tyr Gly Ser Leu Pro Gln Lys Ser His Gly Arg
1 5 10 15

Thr Gln Asp Glu
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<210> 181
<211> 15
<212> PRT
<213> Human herpesvirus

<400> 181

Ala Arg Val Ala Glu His Pro Asp Ala Arg Leu Ala Trp Ala Arg
1 5 10 15

<210> 182
<211> 15
<212> PRT
<213> Homo sapiens

<400> 182

Ala Ser Asp Leu Glu Lys Ile His Leu Asp Glu Lys Ser Phe Arg
1 5 10 15

<210> 183
<211> 20
<212> PRT
<213> Homo sapiens

<400> 183

Ala Ser Gly Gly Thr Phe Ser Ser Phe Ala Ile Asn Trp Val Arg Gln
1 5 10 15

Ala Pro Gly Gln
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<210> 184
<211> 19
<212> PRT
<213> Homo sapiens

<400> 184

Cys Phe Tyr Gln Lys Lys Glu Glu Asp Trp Ile Cys Cys Ala Cys Gln
1 5 10 15

Lys Thr Arg

<210> 185
<211> 15
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<400> 185

Asp Ala Thr Thr Asn Pro Ser Leu Ile Leu Ala Ala Ala Gln Met
1 5 10 15

<210> 186
<211> 15
<212> PRT
<213> Homo sapiens

<400> 186

Asp Phe Leu Thr Ile Ser Pro Lys Leu Leu Gly Glu Leu Leu Gln
1 5 10 15

<210> 187
<211> 20
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<213> Homo sapiens

<400> 187

Asp His Ala Arg His Gly Phe Leu Pro Arg His Arg Asp Thr Gly Ile
1 5 10 15

Leu Asp Ser Ile
20

<210> 188
<211> 15
<212> PRT
<213> Homo sapiens

<400> 188

Asp Pro Gly Val Lys Ser Val Thr Lys Ile Tyr Asn Tyr Tyr Lys
1 5 10 15

<210> 189
<211> 15
<212> PRT
<213> Homo sapiens

<400> 189

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

<210> 190
<211> 23
<212> PRT
<213> Homo sapiens

<400> 190

Asp Arg Phe Ser Gly Ser Lys Ser Val Ser Thr Ala Ser Leu Thr Ile
1 5 10 15

Ser Gly Leu Gln Ala Glu Asp
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<210> 191
<211> 19
<212> PRT
<213> Homo sapiens

<400> 191

Asp Arg Lys Tyr Ser Ile Cys Lys Ser Gly Cys Phe Tyr Gln Lys Lys
1 5 10 15

Glu Glu Asp

<210> 192
<211> 17
<212> PRT
<213> Homo sapiens

<400> 192

Asp Ser Tyr Thr Leu Thr Glu Glu Leu Ala Tyr Ala Glu Ile Arg Val
1 5 10 15

Lys

<210> 193
<211> 20
<212> PRT
<213> Homo sapiens

<400> 193

Asp Tyr Lys Ser Ala His Lys Gly Phe Lys Gly Val Asp Ala Gln Gly
1 5 10 15

Thr Leu Ser Lys
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<210> 194
<211> 15
<212> PRT
<213> Homo sapiens

<400> 194

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

<210> 195
<211> 21
<212> PRT
<213> Homo sapiens

<400> 195

Glu Asp Thr Ala Val Tyr Tyr Cys Ala Arg Asn Ser Gly Tyr Ser Ile
1 5 10 15

Ser Arg Asp Val Tyr
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<210> 196
<211> 15
<212> PRT
<213> Homo sapiens

<400> 196

Glu Lys Ser Phe Arg Trp Leu His Asn Glu Asp Gln Met Ala Val
1 5 10 15

<210> 197
<211> 17
<212> PRT
<213> Homo sapiens

<400> 197

Glu Asn Leu His Arg Thr Phe Asp Pro His Phe Leu Arg Val Pro Cys
1 5 10 15

Trp

<210> 198
<211> 20
<212> PRT
<213> Homo sapiens

<400> 198

Glu Asn Pro Val Val His Phe Phe Lys Asn Ile Val Thr Pro Arg Thr
1 5 10 15

Pro Pro Pro Ser
20

<210> 199
<211> 22
<212> PRT
<213> Homo sapiens

<400> 199

Glu Trp Met Gly Gly Ile Ile Pro Ile Phe Gly Ala Ala Asp Tyr Ala
1 5 10 15

Gln Lys Phe Gln Gly Arg
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<210> 200
<211> 15
<212> PRT

<213> Homo sapiens

<400> 200

Phe Asp Pro His Phe Leu Arg Val Pro Cys Trp Lys Ile Thr Leu
1 5 10 15

<210> 201
<211> 15
<212> PRT
<213> Homo sapiens

<400> 201

Phe Gly Ala Glu Ile Leu Lys Lys Ile Pro Gly Arg Val Ser Thr
1 5 10 15

<210> 202
<211> 15
<212> PRT
<213> Homo sapiens

<400> 202

Phe His Ala Ile Asp Glu Tyr Lys Pro Gln Asp Ala Thr Thr Asn
1 5 10 15

<210> 203
<211> 15
<212> PRT
<213> Measles virus

<400> 203

Phe Ile Val Leu Ser Ile Ala Tyr Pro Thr Leu Ser Glu Ile Lys
1 5 10 15

<210> 204
<211> 20
<212> PRT
<213> Homo sapiens

<400> 204

Phe Lys Gly Val Asp Ala Gln Gly Thr Leu Ser Lys Ile Phe Lys Leu
1 5 10 15

Gly Gly Arg Asp
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<210> 205
<211> 15
<212> PRT
<213> Homo sapiens

<400> 205

Phe Thr Thr Val Val Ala Asp Thr Gly Asp Phe His Ala Ile Asp
1 5 10 15

<210> 206
<211> 15
<212> PRT
<213> Homo sapiens

<400> 206

Gly Glu Leu Leu Gln Asp Asn Ala Lys Leu Val Pro Val Leu Ser
1 5 10 15

<210> 207
<211> 21
<212> PRT
<213> Homo sapiens

<400> 207

Gly Phe Thr Phe Ser Asp Tyr Tyr Met Asn Trp Ile Arg Gln Ala Pro
1 5 10 15

Gly Lys Gly Leu Glu
20

<210> 208
<211> 21
<212> PRT
<213> Homo sapiens

<400> 208

Gly His Trp Gly Ala Trp Met Pro Ser Ser Ile Ser Ala Phe Glu Gly
1 5 10 15

Thr Cys Val Ser Ile
20

<210> 209
<211> 15
<212> PRT
<213> Homo sapiens

<400> 209

Gly Ile His Cys Asn Met Thr Leu Leu Phe Ser Phe Ala Gln Ala
1 5 10 15

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

<400> 210

Gly Ile Lys Gln Leu Gln Ala Arg Val Leu Ala Val Glu Arg Tyr
1 5 10 15

<210> 211
<211> 15
<212> PRT
<213> Homo sapiens

<400> 211

Gly Ile Arg Lys Phe Ala Ala Asp Ala Val Lys Leu Glu Arg Met
1 5 10 15

<210> 212
<211> 22
<212> PRT
<213> Homo sapiens

<400> 212

Gly Asn Ala Lys Asn Ser Leu Tyr Leu Gln Met His Ser Leu Arg Ala
1 5 10 15

Glu Asp Thr Ala Val Tyr
20

<210> 213
<211> 20
<212> PRT
<213> Homo sapiens

<400> 213

Gly Arg Phe Phe Gly Gly Asp Arg Gly Ala Pro Lys Arg Gly Ser Gly
1 5 10 15

Lys Asp Ser His
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<210> 214
<211> 15
<212> PRT
<213> Homo sapiens

<400> 214

Gly Arg Ile Leu Asp Trp His Val Ala Asn Thr Asp Lys Lys Ser
1 5 10 15

<210> 215
<211> 15
<212> PRT
<213> Homo sapiens

<400> 215

Gly Arg Val Ser Thr Glu Val Asp Ala Arg Leu Ser Phe Asp Lys
1 5 10 15

<210> 216
<211> 20
<212> PRT
<213> Homo sapiens

<400> 216

Gly Val Asp Ala Gln Gly Thr Leu Ser Lys Ile Phe Lys Leu Gly Gly
1 5 10 15

Arg Asp Ser Arg
20

<210> 217
<211> 19
<212> PRT
<213> Homo sapiens

<400> 217

His Phe Ser Ile His Cys Cys Pro Pro Phe Thr Phe Leu Asn Ser Lys
1 5 10 15

Lys Glu Ile

<210> 218
<211> 20
<212> PRT
<213> Homo sapiens

<400> 218

His Arg Asp Thr Gly Ile Leu Asp Ser Ile Gly Arg Phe Phe Gly Gly
1 5 10 15

Asp Arg Gly Ala
20

<210> 219
<211> 15
<212> PRT
<213> Homo sapiens

<400> 219

Ile Lys Leu Ser Ser Thr Trp Glu Gly Ile Gln Ala Gly Lys Glu
1 5 10 15

<210> 220
<211> 20
<212> PRT

<213> Homo sapiens

<400> 220

Ile Val Thr Pro Arg Thr Pro Pro Pro Ser Gln Gly Lys Gly Arg Gly
1 5 10 15

Leu Ser Leu Ser
20

<210> 221
<211> 18
<212> PRT
<213> Homo sapiens

<400> 221

Lys Ile Phe Lys Leu Gly Gly Arg Asp Ser Arg Ser Gly Ser Pro Met
1 5 10 15

Ala Arg

<210> 222
<211> 16
<212> PRT
<213> Homo sapiens

<400> 222

Lys Leu Glu Arg Met Leu Thr Glu Arg Met Phe Asn Ala Glu Asn Gly
1 5 10 15

<210> 223
<211> 15
<212> PRT
<213> Homo sapiens

<400> 223

Lys Leu Gly Gly Ser Gln Glu Asp Gln Ile Lys Asn Ala Ile Asp
1 5 10 15

<210> 224
<211> 15
<212> PRT
<213> Homo sapiens

<400> 224

Lys Asn Ala Ile Asp Lys Leu Phe Val Leu Phe Gly Ala Glu Ile
1 5 10 15

<210> 225
<211> 15
<212> PRT

<213> Homo sapiens

<400> 225

Leu Ser Phe Asp Lys Asp Ala Met Val Ala Arg Ala Arg Arg Leu
1 5 10 15

<210> 226
<211> 20
<212> PRT
<213> Homo sapiens

<400> 226

Leu Ser Arg Phe Ser Trp Gly Ala Glu Gly Gln Arg Pro Gly Phe Gly
1 5 10 15

Tyr Gly Gly Arg
20

<210> 227
<211> 20
<212> PRT
<213> Homo sapiens

<400> 227

Leu Ser Tyr Ser His Ser Asp Tyr Asp Leu Gly Lys Arg Pro Thr Lys
1 5 10 15

Asp Ser Tyr Thr
20

<210> 228
<211> 15
<212> PRT
<213> Homo sapiens

<400> 228

Leu Val Glu Glu Ala Ile Ala Tyr Gly Arg Lys Leu Gly Gly Ser
1 5 10 15

<210> 229
<211> 26
<212> PRT
<213> Homo sapiens

<400> 229

Leu Val Gly Asp Glu Val Glu Leu Pro Cys Arg Ile Ser Pro Gly Lys
1 5 10 15

Asn Ala Thr Gly Met Glu Val Gly Trp Tyr
20 25

<210> 230
<211> 25
<212> PRT
<213> Homo sapiens

<400> 230

Leu Tyr Arg Asn Gly Lys Asp Gln Asp Gly Asp Gln Ala Pro Glu Tyr
1 5 10 15

Arg Gly Arg Thr Glu Leu Leu Lys Asp
20 25

<210> 231
<211> 20
<212> PRT
<213> Homo sapiens

<400> 231

Met Ala Ser Gln Lys Arg Pro Ser Gln Arg His Gly Ser Lys Tyr Leu
1 5 10 15

Ala Thr Ala Ser
20

<210> 232
<211> 15
<212> PRT
<213> Homo sapiens

<400> 232

Met Glu Ser Ala Leu Asp Gln Leu Lys Gln Phe Thr Thr Val Val
1 5 10 15

<210> 233
<211> 19
<212> PRT
<213> Homo sapiens

<400> 233

Met Ser Gln Lys Pro Ala Lys Glu Gly Pro Arg Leu Ser Lys Asn Gln
1 5 10 15

Lys Tyr Ser

<210> 234
<211> 15
<212> PRT
<213> Homo sapiens

<400> 234

Met Ser Ser Ser Pro Val Lys Arg Gln Arg Met Glu Ser Ala Leu
1 5 10 15

<210> 235
<211> 15
<212> PRT
<213> Human herpesvirus

<400> 235

Asn Pro Val Met Glu Arg Phe Ala Ala His Ala Gly Asp Leu Val
1 5 10 15

<210> 236
<211> 20
<212> PRT
<213> Homo sapiens

<400> 236

Asn Ser Gly Tyr Ser Ile Ser Arg Asp Val Tyr Trp Gly Gln Gly Thr
1 5 10 15

Leu Val Thr Val
20

<210> 237
<211> 23
<212> PRT
<213> Homo sapiens

<400> 237

Pro Cys Arg Phe Asp Phe Pro Asp Glu Leu Arg Pro Ala Val Val His
1 5 10 15

Gly Val His Tyr Phe Asn Ser
20

<210> 238
<211> 20
<212> PRT
<213> Homo sapiens

<400> 238

Pro Gly Phe Gly Tyr Gly Gly Arg Ala Ser Asp Tyr Lys Ser Ala His
1 5 10 15

Lys Gly Phe Lys
20

<210> 239
<211> 23

<212> PRT
<213> Homo sapiens

<400> 239

Pro Pro Phe Thr Phe Leu Asn Ser Lys Lys Glu Ile Val Asp Arg Lys
1 5 10 15

Tyr Ser Ile Cys Lys Ser Gly
20

<210> 240
<211> 20
<212> PRT
<213> Homo sapiens

<400> 240

Pro Gln Lys Ser His Gly Arg Thr Gln Asp Glu Asn Pro Val Val His
1 5 10 15

Phe Phe Lys Asn
20

<210> 241
<211> 25
<212> PRT
<213> Homo sapiens

<400> 241

Pro Arg Pro Glu Val Arg Pro Pro Pro Ala Lys Gln Arg Pro Pro Gln
1 5 10 15

Lys Ser Lys Gln Gln Pro Arg Ser Ser
20 25

<210> 242
<211> 15
<212> PRT
<213> Homo sapiens

<400> 242

Gln Ala Gly Lys Glu Leu Glu Glu Gln His Gly Ile His Cys Asn
1 5 10 15

<210> 243
<211> 11
<212> PRT
<213> Homo sapiens

<400> 243

Gln Phe Gln Leu Val Glu Ser Gly Gly Gly Leu
1 5 10

<210> 244
<211> 22
<212> PRT
<213> Homo sapiens

<400> 244

Gln Lys Tyr Ser Glu His Phe Ser Ile His Cys Cys Pro Pro Phe Thr
1 5 10 15

Phe Leu Asn Ser Lys Lys
20

<210> 245
<211> 24
<212> PRT
<213> Homo sapiens

<400> 245

Gln Pro Arg Ser Ser Pro Leu Arg Gly Pro Gly Ala Ser Arg Gly Gly
1 5 10 15

Ser Pro Val Lys Ala Ser Arg Phe
20

<210> 246
<211> 24
<212> PRT
<213> Homo sapiens

<400> 246

Gln Gln His Pro Gly Lys Ala Pro Lys Val Met Ile Tyr Asp Val Thr
1 5 10 15

Lys Arg Pro Ser Gly Val Pro Asp
20

<210> 247
<211> 23
<212> PRT
<213> Homo sapiens

<400> 247

Gln Arg Pro Pro Gln Lys Ser Lys Gln Gln Pro Arg Ser Ser Pro Leu
1 5 10 15

Arg Gly Pro Gly Ala Ser Arg
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<210> 248

<211> 12
<212> PRT
<213> Homo sapiens

<400> 248

Gln Ser Val Leu Thr Gln Pro Arg Ser Val Ser Gly
1 5 10

<210> 249
<211> 13
<212> PRT
<213> Homo sapiens

<400> 249

Gln Ser Val Leu Thr Gln Ser Pro Ser Ala Ser Ala Ser
1 5 10

<210> 250
<211> 20
<212> PRT
<213> Homo sapiens

<400> 250

Gln Thr Trp Gly Thr Gly Ile Glu Thr Val Phe Gly Gly Gly Thr Lys
1 5 10 15

Val Thr Val Leu
20

<210> 251
<211> 21
<212> PRT
<213> Homo sapiens

<400> 251

Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys Ala Arg Arg Lys Val Ala
1 5 10 15

Met Ala Thr Thr Tyr
20

<210> 252
<211> 15
<212> PRT
<213> Homo sapiens

<400> 252

Arg Ala Arg Arg Leu Ile Glu Leu Tyr Lys Glu Ala Gly Ile Ser
1 5 10 15

<210> 253

<211> 20
<212> PRT
<213> Homo sapiens

<400> 253

Arg Phe Ser Trp Gly Ala Glu Gly Gln Arg Pro Gly Phe Gly Tyr Gly
1 5 10 15

Gly Arg Ala Ser
20

<210> 254
<211> 20
<212> PRT
<213> Homo sapiens

<400> 254

Arg Gly Ser Gly Lys Asp Ser His His Pro Ala Arg Thr Ala His Tyr
1 5 10 15

Gly Ser Leu Pro
20

<210> 255
<211> 19
<212> PRT
<213> Homo sapiens

<400> 255

Arg Leu Ser Lys Asn Gln Lys Tyr Ser Glu His Phe Ser Ile His Cys
1 5 10 15

Cys Pro Pro

<210> 256
<211> 19
<212> PRT
<213> Homo sapiens

<400> 256

Arg Pro Gly Phe Gly Tyr Gly Gly Arg Ala Ser Asp Tyr Lys Ser Ala
1 5 10 15

His Lys Gly

<210> 257
<211> 15
<212> PRT
<213> Homo sapiens

<400> 257

Ser Phe Ala Gln Ala Val Ala Cys Ala Glu Ala Gly Val Thr Leu
1 5 10 15

<210> 258
<211> 24
<212> PRT
<213> Homo sapiens

<400> 258

Ser Gly Cys Phe Tyr Gln Lys Lys Glu Glu Asp Trp Ile Cys Cys Ala
1 5 10 15

Cys Gln Lys Thr Arg Thr Ser Arg
20

<210> 259
<211> 20
<212> PRT
<213> Homo sapiens

<400> 259

Ser Lys Tyr Leu Ala Thr Ala Ser Thr Met Asp His Ala Arg His Gly
1 5 10 15

Phe Leu Pro Arg
20

<210> 260
<211> 20
<212> PRT
<213> Homo sapiens

<400> 260

Ser Gln Arg His Gly Ser Lys Tyr Leu Ala Thr Ala Ser Thr Met Asp
1 5 10 15

His Ala Arg His
20

<210> 261
<211> 20
<212> PRT
<213> Homo sapiens

<400> 261

Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Gly Asn Ala Lys Asn Ser
1 5 10 15

Leu Tyr Leu Gln
20

<210> 262
<211> 19
<212> PRT
<213> Homo sapiens

<400> 262

Ser Tyr Ala Gly Gly Ser Ala Cys Val Phe Gly Thr Gly Thr Lys Leu
1 5 10 15

Thr Val Leu

<210> 263
<211> 15
<212> PRT
<213> Homo sapiens

<400> 263

Thr Asp Lys Lys Ser Tyr Glu Pro Leu Glu Asp Pro Gly Val Lys
1 5 10 15

<210> 264
<211> 19
<212> PRT
<213> Homo sapiens

<400> 264

Thr Phe Leu Asn Ser Lys Lys Glu Ile Val Asp Arg Lys Tyr Ser Ile
1 5 10 15

Cys Lys Ser

<210> 265
<211> 15
<212> PRT
<213> Homo sapiens

<400> 265

Thr Gly Glu Ile Lys Ala Leu Ala Gly Cys Asp Phe Leu Thr Ile
1 5 10 15

<210> 266
<211> 15
<212> PRT
<213> Homo sapiens

<400> 266

Thr Ile Val Met Gly Ala Ser Phe Arg Asn Thr Gly Glu Ile Lys
1 5 10 15

<210> 267
<211> 20
<212> PRT
<213> Homo sapiens

<400> 267

Val Ile Val Glu Met Asn Ser Ser Val Glu Ala Ile Glu Gly Ser His
1 5 10 15

Val Ser Leu Leu
20

<210> 268
<211> 15
<212> PRT
<213> Human herpesvirus

<400> 268

Val Pro Val Leu Ala Phe Asp Ala Ala Arg Leu Arg Leu Leu Glu
1 5 10 15

<210> 269
<211> 15
<212> PRT
<213> Homo sapiens

<400> 269

Val Pro Val Leu Ser Ala Lys Ala Ala Gln Ala Ser Asp Leu Glu
1 5 10 15

<210> 270
<211> 20
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 270

Tyr Asp Glu Asn Pro Val Val His Phe Phe Lys Asn Ile Val Thr Pro
1 5 10 15

Arg Thr Pro Pro
20

<210> 271
<211> 15
<212> PRT
<213> Homo sapiens

<400> 271

Tyr Asn Tyr Tyr Lys Lys Phe Ser Tyr Lys Thr Ile Val Met Gly
1 5 10 15

<210> 272
<211> 15
<212> PRT
<213> Homo sapiens

<400> 272

Ala Arg Thr Ala His Tyr Gly Ser Leu Pro Gln Lys Ser His Gly
1 5 10 15

<210> 273
<211> 20
<212> PRT
<213> Cavia porcellus

<400> 273

Ala Ser Gln Lys Arg Pro Ser Gln Arg His Gly Ser Lys Tyr Leu Ala
1 5 10 15

Thr Ala Ser Thr
20

<210> 274
<211> 38
<212> PRT
<213> Homo sapiens

<400> 274

Ala Ser Gln Lys Arg Pro Ser Gln Arg His Gly Ser Lys Tyr Leu Ala
1 5 10 15

Thr Ala Ser Thr Met Asp His Ala Arg His Gly Phe Leu Pro Arg His
20 25 30

Arg Asp Thr Gly Ile Leu
35

<210> 275
<211> 17
<212> PRT
<213> Human herpesvirus

<400> 275

Asp Ala Tyr Pro Cys Tyr Phe Phe Lys Ser Ala Cys Arg Pro Arg Ala
1 5 10 15

Pro

<210> 276
<211> 17
<212> PRT
<213> Homo sapiens

<400> 276

Asp Glu Asn Pro Val Val His Phe Phe Lys Asn Ile Val Thr Pro Arg
1 5 10 15

Thr

<210> 277
<211> 8
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 277

Glu Ala Gly Ala Gly Gly Gly Ala
1 5

<210> 278
<211> 12
<212> PRT
<213> Bos taurus

<400> 278

Glu Asp Lys Gly Ala Cys Leu Leu Pro Lys Ile Glu
1 5 10

<210> 279
<211> 15
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 279

Glu Asn Pro Lys Val His Phe Phe Lys Asn Ile Val Thr Pro Arg
1 5 10 15

<210> 280
<211> 8
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 280

Glu Pro Ala Arg Ser Arg Ser Arg
1 5

<210> 281
<211> 15
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 281

Glu Pro Met Thr Pro His Gln Trp Ile Thr Leu Tyr Arg Ser Tyr
1 5 10 15

<210> 282
<211> 15
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 282

Phe Cys Pro Pro Ile Leu Pro Tyr Ser Ala Trp Cys Pro Val Pro
1 5 10 15

<210> 283
<211> 20
<212> PRT
<213> Mus musculus

<400> 283

Gly Phe Gly Tyr Gly Gly Arg Ala Ser Asp Tyr Lys Ser Ala His Lys
1 5 10 15

Gly Phe Lys Gly
20

<210> 284
<211> 12
<212> PRT
<213> Homo sapiens

<400> 284

Gly Lys Trp Leu Gly His Pro Asp Lys Phe Val Gly
1 5 10

<210> 285
<211> 19
<212> PRT
<213> Homo sapiens

<400> 285

Gly Ser Lys Tyr Leu Ala Thr Ala Ser Thr Met Asp His Ala Arg His
1 5 10 15

Gly Phe Leu

<210> 286
<211> 20
<212> PRT
<213> Homo sapiens

<400> 286

Gly Ser Lys Tyr Leu Ala Thr Ala Ser Thr Met Asp His Ala Arg His
1 5 10 15

Gly Phe Leu Pro
20

<210> 287
<211> 15
<212> PRT
<213> Homo sapiens

<400> 287

His His Pro Ala Arg Thr Ala His Tyr Gly Ser Leu Pro Gln Lys
1 5 10 15

<210> 288
<211> 22
<212> PRT
<213> Homo sapiens

<400> 288

His His Pro Ala Arg Thr Ala His Tyr Gly Ser Leu Pro Gln Lys Ser
1 5 10 15

His Gly Arg Thr Gln Asp
20

<210> 289
<211> 15
<212> PRT
<213> Human papillomavirus

<400> 289

Ile Gly Gly Arg Val His Phe Phe Lys Asp Ile Ser Pro Ile Ala
1 5 10 15

<210> 290
<211> 11
<212> PRT
<213> Homo sapiens

<400> 290

Lys Leu Ser Asp Gly Ile Arg Lys Phe Ala Ala
1 5 10

<210> 291
<211> 16
<212> PRT
<213> Homo sapiens

<400> 291

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

<210> 292
<211> 21
<212> PRT
<213> Homo sapiens

<400> 292

Lys Ser His Gly Arg Thr Gln Asp Glu Asn Pro Val Val His Phe Phe
1 5 10 15

Lys Asn Ile Val Thr
20

<210> 293
<211> 21
<212> PRT
<213> Homo sapiens

<400> 293

Lys Ser His Gly Arg Thr Gln Asp Gln Asp Pro Val Val His Phe Phe
1 5 10 15

Lys Asn Ile Val Thr
20

<210> 294
<211> 9
<212> PRT
<213> Homo sapiens

<400> 294

Leu Leu Phe Ser Phe Ala Gln Ala Val
1   5

<210> 295
<211> 20
<212> PRT
<213> Cavia porcellus

<400> 295

Met Asp His Ala Arg His Gly Phe Leu Pro Arg His Arg Asp Thr Gly
1   5   10   15

Ile Leu Asp Ser
            20

<210> 296
<211> 15
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 296

Met Pro Val Ser Arg Leu Cys Ile Glu Leu Asp Trp Cys Pro Pro
1   5   10   15

<210> 297
<211> 20
<212> PRT
<213> Homo sapiens

<400> 297

Pro Ser Gln Gly Lys Gly Arg Gly Leu Ser Leu Ser Arg Phe Ser Trp
1   5   10   15

Gly Ala Glu Gly
            20

<210> 298
<211> 15
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 298

Arg Gly Thr Gln Glu Trp Thr Glu Leu Trp Val Ser Phe Arg Ala
1   5   10   15

<210> 299

<211> 16
<212> PRT
<213> Homo sapiens

<400> 299

Ser His His Pro Ala Arg Thr Ala His Tyr Gly Ser Leu Pro Gln Lys
1 5 10 15

<210> 300
<211> 15
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 300

Ser Arg Gly Ser His Glu Trp Ala Val Leu Phe Arg Phe Tyr Tyr
1 5 10 15

<210> 301
<211> 15
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 301

Ser Ser Ala Lys Ser His Cys Tyr Ala Phe Cys Ser Gly Leu Pro
1 5 10 15

<210> 302
<211> 12
<212> PRT
<213> Homo sapiens

<400> 302

Thr Cys Phe Phe Arg Asp His Ser Tyr Gln Glu Glu
1 5 10

<210> 303
<211> 10
<212> PRT
<213> Homo sapiens

<400> 303

Thr Gln Asp Glu Asn Pro Val Val His Phe
1 5 10

<210> 304
<211> 18
<212> PRT

<213> Homo sapiens

<400> 304

Thr Gln Asp Gln Asp Pro Val Val His Phe Phe Lys Asn Ile Val Thr
1 5 10 15

Pro Arg

<210> 305
<211> 12
<212> PRT
<213> Bos taurus

<400> 305

Thr Ser Val Phe Asp Lys Leu Lys His Leu Val Asp
1 5 10

<210> 306
<211> 21
<212> PRT
<213> Mus musculus

<400> 306

Val His Phe Phe Lys Asn Ile Val Thr Pro Arg Thr Pro Pro Pro Ser
1 5 10 15

Gln Gly Lys Gly Arg
20

<210> 307
<211> 10
<212> PRT
<213> Homo sapiens

<400> 307

Val Val His Phe Phe Lys Asn Ile Val Thr
1 5 10

<210> 308
<211> 15
<212> PRT
<213> Homo sapiens

<400> 308

Tyr Gly Ser Leu Pro Gln Lys Ser His Gly Arg Thr Gln Asp Gln
1 5 10 15

<210> 309
<211> 17
<212> PRT

<213> Homo sapiens

<400> 309

Tyr Lys Asp Ser His His Pro Ala Arg Thr Ala His Tyr Gly Ser Leu
1 5 10 15

Pro

<210> 310
<211> 9
<212> PRT
<213> Homo sapiens

<400> 310

Asp Tyr Lys Ser Ala His Lys Gly Phe
1 5

<210> 311
<211> 15
<212> PRT
<213> Homo sapiens

<400> 311

Gly Lys Asp Ser His His Pro Ala Arg Thr Ala His Tyr Gly Ser
1 5 10 15

<210> 312
<211> 9
<212> PRT
<213> Homo sapiens

<400> 312

Lys Tyr Leu Ala Thr Ala Ser Thr Met
1 5

<210> 313
<211> 21
<212> PRT
<213> Homo sapiens

<400> 313

Asp Glu Asn Pro Val Val His Phe Phe Lys Asn Ile Val Thr Pro Arg
1 5 10 15

Thr Pro Pro Pro Ser
20

<210> 314
<211> 12
<212> PRT

<213> Homo sapiens

<400> 314

Phe Phe Lys Asn Ile Val Thr Pro Arg Thr Pro Pro
1 5 10

<210> 315
<211> 21
<212> PRT
<213> Homo sapiens

<400> 315

Thr Gly Gly Gln Lys Gly Arg Gly Ser Arg Gly Gln His Gln Ala His
1 5 10 15

Ser Leu Glu Arg Val
20

<210> 316
<211> 18
<212> PRT
<213> Homo sapiens

<400> 316

Tyr Lys Thr Thr Ile Cys Gly Lys Gly Leu Ser Ala Thr Val Thr Gly
1 5 10 15

Gly Gln

<210> 317
<211> 20
<212> PRT
<213> Homo sapiens

<400> 317

Gly Leu Ser Leu Ser Arg Phe Ser Trp Gly Ala Glu Gly Gln Arg Pro
1 5 10 15

Gly Phe Gly Tyr
20

<210> 318
<211> 19
<212> PRT
<213> Homo sapiens

<400> 318

Ala Pro Lys Arg Gly Ser Gly Lys Asp Ser His His Ala Ala Arg Thr
1 5 10 15

Ala His Tyr

<210> 319
<211> 23
<212> PRT
<213> Homo sapiens

<400> 319

Asp Ala Ile Gly Glu Gly Lys Val Thr Leu Arg Ile Arg Asn Val Arg
1 5 10 15

Phe Ser Asp Glu Gly Gly Phe
20

<210> 320
<211> 21
<212> PRT
<213> Homo sapiens

<400> 320

Asp Ser Ile Gly Arg Phe Phe Gly Gly Asp Arg Gly Ala Pro Lys Arg
1 5 10 15

Gly Ser Gly Lys Asp
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<210> 321
<211> 20
<212> PRT
<213> Homo sapiens

<400> 321

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

Val Gly Trp Tyr
20

<210> 322
<211> 23
<212> PRT
<213> Homo sapiens

<400> 322

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

Lys Val Thr Leu Arg Ile Arg
20

<210> 323
<211> 20
<212> PRT
<213> Homo sapiens

<400> 323

Phe Ser Trp Gly Ala Glu Gly Gln Arg Pro Gly Phe Gly Tyr Gly Gly
1 5 10 15

Arg Ala Ser Asp
20

<210> 324
<211> 22
<212> PRT
<213> Homo sapiens

<400> 324

Gly Gly Gln Lys Gly Arg Gly Ser Arg Gly Gln His Gln Ala His Ser
1 5 10 15

Leu Glu Arg Val Cys His
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<210> 325
<211> 15
<212> PRT
<213> Herpes simplex virus

<400> 325

Gly Gly Arg Arg Leu Phe Phe Val Lys Ala His Val Arg Glu Ser
1 5 10 15

<210> 326
<211> 20
<212> PRT
<213> Homo sapiens

<400> 326

Gly Lys Gly Arg Gly Leu Ser Leu Ser Arg Phe Ser Trp Gly Ala Glu
1 5 10 15

Gly Gln Arg Pro
20

<210> 327
<211> 24
<212> PRT
<213> Homo sapiens

<400> 327

Gly Leu Ser Leu Ser Arg Phe Ser Trp Gly Ala Glu Gly Gln Arg Pro
1 5 10 15

Gly Phe Gly Tyr Gly Gly Arg Ala
20

<210> 328
<211> 23
<212> PRT
<213> Homo sapiens

<400> 328

Gly Met Glu Val Gly Trp Tyr Arg Pro Pro Phe Ser Arg Val Val His
1 5 10 15

Leu Tyr Arg Asn Gly Lys Asp
20

<210> 329
<211> 22
<212> PRT
<213> Homo sapiens

<400> 329

Gly Gln Phe Arg Val Ile Gly Pro Arg His Pro Ile Arg Ala Leu Val
1 5 10 15

Gly Asp Glu Val Glu Leu
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<210> 330
<211> 15
<212> PRT
<213> Homo sapiens

<400> 330

Gly Thr Leu Ser Lys Ile Phe Lys Leu Gly Gly Arg Asp Ser Arg
1 5 10 15

<210> 331
<211> 26
<212> PRT
<213> Homo sapiens

<400> 331

Gly Val Asp Ala Gln Gly Thr Leu Ser Lys Ile Phe Lys Leu Gly Gly
1 5 10 15

Arg Asp Ser Arg Ser Gly Ser Pro Met Ala

20 25

<210> 332
<211> 19
<212> PRT
<213> Homo sapiens

<400> 332

His Ala Ala Arg Thr Ala His Tyr Gly Ser Leu Pro Gln Lys Ser Gln
1 5 10 15

Gly His Arg

<210> 333
<211> 17
<212> PRT
<213> Homo sapiens

<400> 333

His Cys Leu Gly Lys Trp Leu Gly His Pro Asp Lys Phe Val Gly Ile
1 5 10 15

Thr

<210> 334
<211> 15
<212> PRT
<213> Homo sapiens

<400> 334

Leu Gly His Pro Asp Lys Phe Val Gly Ile Thr Tyr Ala Leu Thr
1 5 10 15

<210> 335
<211> 20
<212> PRT
<213> Homo sapiens

<400> 335

Leu Gly Gln Gly Pro Glu Phe Leu Thr Tyr Phe Gln Asn Glu Ala Gln
1 5 10 15

Leu Glu Lys Ser
20

<210> 336
<211> 20
<212> PRT
<213> Homo sapiens

<400> 336

Leu Leu Ala Glu Gly Phe Tyr Thr Thr Gly Ala Val Arg Gln Ile Phe
1 5 10 15

Gly Asp Tyr Lys
20

<210> 337
<211> 19
<212> PRT
<213> Homo sapiens

<400> 337

Asn Pro Val Val His Phe Phe Lys Asn Ile Val Thr Pro Arg Thr Pro
1 5 10 15

Pro Pro Ser

<210> 338
<211> 20
<212> PRT
<213> Homo sapiens

<400> 338

Pro Gln Asp Glu Asn Pro Val Val His Phe Phe Lys Asn Ile Val Thr
1 5 10 15

Pro Arg Thr Pro
20

<210> 339
<211> 20
<212> PRT
<213> Homo sapiens

<400> 339

Pro Arg His Arg Asp Thr Gly Ile Leu Asp Ser Ile Gly Arg Phe Phe
1 5 10 15

Gly Gly Asp Arg
20

<210> 340
<211> 19
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 340

Gln Ala His Ser Leu Glu Arg Val Ser His Ser Leu Gly Lys Trp Leu
1 5 10 15

Gly His Pro

<210> 341
<211> 20
<212> PRT
<213> Homo sapiens

<400> 341

Arg Asp Thr Gly Ile Leu Asp Ser Ile Gly Arg Phe Phe Gly Gly Asp
1 5 10 15

Arg Gly Ala Pro
20

<210> 342
<211> 20
<212> PRT
<213> Homo sapiens

<400> 342

Arg Phe Phe Gly Gly Asp Arg Gly Ala Pro Lys Arg Gly Ser Gly Lys
1 5 10 15

Asp Ser His His
20

<210> 343
<211> 20
<212> PRT
<213> Homo sapiens

<400> 343

Arg Thr Ala His Tyr Gly Ser Leu Pro Gln Lys Ser His Gly Arg Thr
1 5 10 15

Gln Asp Glu Asn
20

<210> 344
<211> 20
<212> PRT
<213> Homo sapiens

<400> 344

Tyr Lys Ser Ala His Lys Gly Phe Lys Gly Val Asp Ala Gln Gly Thr
1 5 10 15

Leu Ser Lys Ile
20

<210> 345
<211> 25
<212> PRT
<213> Homo sapiens

<400> 345

Ala Ala Arg Thr Thr His Tyr Gly Ser Leu Pro Gln Lys Ser Gln Arg
1 5 10 15

Ser Gln Asp Gln Asn Pro Val His Phe
20 25

<210> 346
<211> 25
<212> PRT
<213> Bos taurus

<400> 346

Ala Glu Tyr Arg Gly Arg Val Ser Leu Val Glu Asp His Ile Ala Glu
1 5 10 15

Gly Ser Val Ala Val Arg Ile Gln Glu
20 25

<210> 347
<211> 17
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 347

Ala Lys Pro Val Val His Leu Phe Ala Asn Ile Val Thr Pro Arg Thr
1 5 10 15

Pro

<210> 348
<211> 26
<212> PRT
<213> Bos taurus

<400> 348

Ala Pro Phe Asp Val Ile Gly Pro Gln Glu Pro Ile Leu Ala Val Val
1 5 10 15

Gly Glu Asp Ala Glu Leu Pro Cys Arg Leu
20 25

<210> 349
<211> 11
<212> PRT
<213> Homo sapiens

<400> 349

Ala Ser Asp Tyr Lys Ser Ala His Lys Gly Phe
1 5 10

<210> 350
<211> 19
<212> PRT
<213> Homo sapiens

<400> 350

Ala Ser Gln Lys Arg Pro Ser Gln Arg His Gly Lys Tyr Leu Ala Thr
1 5 10 15

Ala Ser Thr

<210> 351
<211> 20
<212> PRT
<213> Mus musculus

<400> 351

Ala Ser Gln Lys Arg Pro Ser Gln Arg Ser Lys Tyr Leu Ala Thr Ala
1 5 10 15

Ser Thr Met Asp
20

<210> 352
<211> 26
<212> PRT
<213> Bos taurus

<400> 352

Ala Val Val Gly Glu Asp Ala Glu Leu Pro Cys Arg Leu Ser Pro Asn
1 5 10 15

Val Ser Ala Lys Gly Met Glu Leu Arg Trp
20 25

<210> 353
<211> 11
<212> PRT
<213> Homo sapiens

<400> 353

Asp Glu Asn Pro Val Val His Phe Phe Lys Asn
1 5 10

<210> 354
<211> 17
<212> PRT
<213> Homo sapiens

<400> 354

Glu Asn Pro Val Val His Glu Phe Lys Asn Ile Val Thr Pro Arg Thr
1 5 10 15

Pro

<210> 355
<211> 14
<212> PRT
<213> Homo sapiens

<400> 355

Glu Asn Pro Val Val His Phe Phe Lys Asn Ile Val Thr Pro
1 5 10

<210> 356
<211> 15
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 356

Glu Asn Pro Val Val His Phe Phe Leu Asn Ile Val Thr Pro Arg
1 5 10 15

<210> 357
<211> 15
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 357

Glu Asn Pro Val Val His Phe Phe Arg Asn Ile Val Thr Pro Arg

1 5 10 15

<210> 358
<211> 19
<212> PRT
<213> Homo sapiens

<400> 358

Gly Leu Ser Leu Ser Arg Phe Ser Trp Gly Ala Gln Gly Gln Lys Pro
1 5 10 15

Gly Phe Gly

<210> 359
<211> 23
<212> PRT
<213> Homo sapiens

<400> 359

Gly Thr Leu Ser Lys Ile Phe Lys Leu Gly Gly Arg Asp Ser Arg Ser
1 5 10 15

Gly Ser Pro Met Ala Arg Arg
20

<210> 360
<211> 25
<212> PRT
<213> Bos taurus

<400> 360

Ile Ala Glu Gly Ser Val Ala Val Arg Ile Gln Glu Val Lys Ala Ser
1 5 10 15

Asp Asp Gly Glu Tyr Arg Cys Phe Phe
20 25

<210> 361
<211> 25
<212> PRT
<213> Bos taurus

<400> 361

Lys Ala Ser Asp Asp Gly Glu Tyr Arg Cys Phe Phe Arg Gln Asp Glu
1 5 10 15

Asn Tyr Glu Glu Ala Ile Val His Leu
20 25

<210> 362
<211> 22
<212> PRT
<213> Homo sapiens

<400> 362

Lys Ser His Gly Arg Thr Gln Asp Glu Asn Pro Val Val His Phe Phe
1 5 10 15

Lys Asn Ile Val Thr Pro
20

<210> 363
<211> 17
<212> PRT
<213> Homo sapiens

<400> 363

Leu Ala Thr Ala Ser Thr Met Asp His Ala Arg His Gly Phe Leu Pro
1 5 10 15

Arg

<210> 364
<211> 14
<212> PRT
<213> Homo sapiens

<400> 364

Asn Pro Val Val His Phe Phe Lys Asn Ile Val Thr Pro Arg
1 5 10

<210> 365
<211> 19
<212> PRT
<213> Homo sapiens

<400> 365

Gln Asp Glu Asn Pro Val Val His Phe Phe Lys Asn Ile Val Thr Pro
1 5 10 15

Arg Thr Pro

<210> 366
<211> 20
<212> PRT
<213> Bos taurus

<400> 366

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Arg Gln Asp Glu Asn Tyr Glu Glu Ala Ile Val His Leu Lys Val Ala
1               5                   10                  15

Ala Leu Gly Ser
            20
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<210> 367
<211> 23
<212> PRT
<213> Bos taurus

<400> 367

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Arg Trp Phe Arg Glu Lys Val Ser Pro Ala Val Phe Val Ser Arg Glu
1               5                   10                  15

Gly Gln Glu Gln Glu Gly Glu
            20
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<210> 368
<211> 24
<212> PRT
<213> Bos taurus

<400> 368

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Ser Pro Asn Val Ser Ala Lys Gly Met Glu Leu Arg Trp Phe Arg Glu
1               5                   10                  15

Lys Val Ser Pro Ala Val Phe Val
            20
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<210> 369
<211> 18
<212> PRT
<213> Bos taurus

<400> 369

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Thr Leu Ser Lys Ile Phe Lys Leu Gly Gly Arg Asp Ser Arg Ser Gly
1               5                   10                  15

Ser Pro
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<210> 370
<211> 13
<212> PRT
<213> Homo sapiens

<400> 370

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Val His Phe Phe Lys Asn Ile Val Thr Pro Arg Thr Glu
1               5                   10
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<210> 371
<211> 24
<212> PRT
<213> Bos taurus

<400> 371

Val Ser Arg Glu Gly Gln Glu Gln Glu Gly Glu Met Ala Glu Tyr Arg
1 5 10 15

Gly Arg Val Ser Leu Val Glu Asp
20

<210> 372
<211> 23
<212> PRT
<213> Homo sapiens

<400> 372

Val Thr Pro Arg Thr Pro Pro Pro Ser Gln Gly Lys Gly Arg Gly Leu
1 5 10 15

Ser Leu Ser Arg Phe Ser Trp
20

<210> 373
<211> 18
<212> PRT
<213> Homo sapiens

<400> 373

Ala Leu Gly Gln Gly Pro Gln Phe Ile Phe Gln Tyr Tyr Glu Glu Glu
1 5 10 15

Glu Arg

<210> 374
<211> 19
<212> PRT
<213> Homo sapiens

<400> 374

Gly Leu Ser Leu Ser Arg Phe Ser Trp Gly Ala Glu Gly Gln Arg Pro
1 5 10 15

Gly Phe Gly

<210> 375
<211> 19

<212> PRT
<213> Homo sapiens

<400> 375

Gly Leu Ser Leu Ser Arg Phe Ser Trp Gly Ala Glu Gly Gln Arg Pro
1 5 10 15

Gly Phe Gly

<210> 376
<211> 14
<212> PRT
<213> Homo sapiens

<400> 376

His Lys Gly Phe Lys Gly Val Asp Ala Gln Gly Thr Leu Ser
1 5 10

<210> 377
<211> 24
<212> PRT
<213> Homo sapiens

<400> 377

Lys Ser His Gly Arg Thr Gln Asp Glu Asn Pro Val Val His Phe Phe
1 5 10 15

Lys Asn Ile Val Thr Pro Arg Thr
20

<210> 378
<211> 21
<212> PRT
<213> Homo sapiens

<400> 378

Leu Gly Gln Gly Pro Glu Phe Leu Ile Tyr Phe Gln Gly Thr Gly Ala
1 5 10 15

Ala Asp Asp Ser Gly
20

<210> 379
<211> 20
<212> PRT
<213> Homo sapiens

<400> 379

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

Asn Val Arg Phe
20

<210> 380
<211> 20
<212> PRT
<213> Homo sapiens

<400> 380

Gln Ala Pro Glu Tyr Arg Gly Arg Thr Glu Leu Leu Lys Asp Ala Ile
1 5 10 15

Gly Glu Gly Lys
20

<210> 381
<211> 20
<212> PRT
<213> Homo sapiens

<400> 381

Arg Asp His Ser Tyr Gln Glu Glu Ala Ala Met Glu Leu Lys Val Glu
1 5 10 15

Asp Pro Phe Tyr
20

<210> 382
<211> 20
<212> PRT
<213> Homo sapiens

<400> 382

Arg Pro Pro Phe Ser Arg Val Val His Leu Tyr Arg Asn Gly Lys Asp
1 5 10 15

Gln Asp Gly Asp
20

<210> 383
<211> 20
<212> PRT
<213> Homo sapiens

<400> 383

Ser Asp Glu Gly Gly Phe Thr Cys Phe Phe Arg Asp His Ser Tyr Gln
1 5 10 15

Glu Glu Ala Ala

20

<210> 384
<211> 20
<212> PRT
<213> Homo sapiens

<400> 384

Ser Lys Ile Phe Lys Leu Gly Gly Arg Asp Ser Arg Ser Gly Ser Pro
1 5 10 15

Met Ala Arg Arg
20

<210> 385
<211> 19
<212> PRT
<213> Homo sapiens

<400> 385

Ser Arg Gly Gln His Gln Ala His Ser Leu Glu Arg Val Cys His Cys
1 5 10 15

Leu Gly Lys

<210> 386
<211> 20
<212> PRT
<213> Homo sapiens

<400> 386

Val Thr Leu Arg Ile Arg Asn Val Arg Phe Ser Asp Glu Gly Gly Phe
1 5 10 15

Thr Cys Phe Phe
20

<210> 387
<211> 20
<212> PRT
<213> Homo sapiens

<400> 387

Tyr Arg Asn Gly Lys Asp Gln Asp Gly Asp Gln Ala Pro Glu Tyr Arg
1 5 10 15

Gly Arg Thr Glu
20

<210> 388
<211> 9
<212> PRT
<213> Homo sapiens

<400> 388

Leu Met Trp Ala Lys Ile Gly Pro Val
1 5

<210> 389
<211> 9
<212> PRT
<213> Homo sapiens

<400> 389

Ser Leu Leu Leu Glu Leu Glu Glu Val
1 5

<210> 390
<211> 9
<212> PRT
<213> Homo sapiens

<400> 390

Val Leu Phe Ser Ser Asp Phe Arg Ile
1 5

<210> 391
<211> 12
<212> PRT
<213> Homo sapiens

<400> 391

Ala Pro Glu Tyr Arg Gly Arg Thr Glu Leu Leu Lys
1 5 10

<210> 392
<211> 12
<212> PRT
<213> Homo sapiens

<400> 392

Ala Thr Gly Met Glu Val Gly Trp Tyr Arg Pro Pro
1 5 10

<210> 393
<211> 12
<212> PRT
<213> Homo sapiens

<400> 393

Asp Glu Gly Gly Phe Thr Cys Phe Phe Arg Asp His

1 5 10

<210> 394
<211> 12
<212> PRT
<213> Homo sapiens

<400> 394

Asp His Ser Tyr Gln Glu Glu Ala Ala Met Glu Leu
1 5 10

<210> 395
<211> 12
<212> PRT
<213> Homo sapiens

<400> 395

Asp Pro Phe Tyr Trp Val Ser Pro Gly Val Leu Val
1 5 10

<210> 396
<211> 12
<212> PRT
<213> Homo sapiens

<400> 396

Glu Glu Ala Ala Met Glu Leu Lys Val Glu Asp Pro
1 5 10

<210> 397
<211> 12
<212> PRT
<213> Homo sapiens

<400> 397

Glu Leu Lys Val Glu Asp Pro Phe Tyr Trp Val Ser
1 5 10

<210> 398
<211> 12
<212> PRT
<213> Homo sapiens

<400> 398

Gly Asp Glu Val Glu Leu Pro Cys Arg Ile Ser Pro
1 5 10

<210> 399
<211> 12
<212> PRT
<213> Homo sapiens

<400> 399

Gly Glu Gly Lys Val Thr Leu Arg Ile Arg Asn Val
1 5 10

<210> 400
<211> 12
<212> PRT
<213> Homo sapiens

<400> 400

Gly Pro Arg His Pro Ile Arg Ala Leu Val Gly Asp
1 5 10

<210> 401
<211> 12
<212> PRT
<213> Homo sapiens

<400> 401

Gly Arg Thr Glu Leu Leu Lys Asp Ala Ile Gly Glu
1 5 10

<210> 402
<211> 12
<212> PRT
<213> Homo sapiens

<400> 402

Ile Arg Ala Leu Val Gly Asp Glu Val Glu Leu Pro
1 5 10

<210> 403
<211> 19
<212> PRT
<213> Homo sapiens

<400> 403

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

Arg Gly Leu

<210> 404
<211> 12
<212> PRT
<213> Homo sapiens

<400> 404

Leu Lys Asp Ala Ile Gly Glu Gly Lys Val Thr Leu
1 5 10

<210> 405
<211> 12
<212> PRT
<213> Homo sapiens

<400> 405

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

<210> 406
<211> 19
<212> PRT
<213> Homo sapiens

<400> 406

Met Asp His Ala Arg His Gly Phe Leu Pro Arg His Arg Asp Thr Gly
1 5 10 15

Ile Leu Asp

<210> 407
<211> 12
<212> PRT
<213> Homo sapiens

<400> 407

Asn Val Arg Phe Ser Asp Glu Gly Gly Phe Thr Cys
1 5 10

<210> 408
<211> 12
<212> PRT
<213> Homo sapiens

<400> 408

Pro Pro Phe Ser Arg Val Val His Leu Tyr Arg Asn
1 5 10

<210> 409
<211> 19
<212> PRT
<213> Homo sapiens

<400> 409

Pro Ser Gln Gly Lys Gly Arg Gly Leu Ser Leu Ser Arg Phe Ser Trp
1 5 10 15

Gly Ala Glu

<210> 410
<211> 12
<212> PRT
<213> Homo sapiens

<400> 410

Gln Asp Gly Asp Gln Ala Pro Glu Tyr Arg Gly Arg
1 5 10

<210> 411
<211> 12
<212> PRT
<213> Homo sapiens

<400> 411

Gln Phe Arg Val Ile Gly Pro Arg His Pro Ile Arg
1 5 10

<210> 412
<211> 19
<212> PRT
<213> Homo sapiens

<400> 412

Gln Arg Pro Gly Phe Gly Tyr Gly Gly Arg Ala Ser Asp Tyr Lys Ser
1 5 10 15

Ala His Lys

<210> 413
<211> 12
<212> PRT
<213> Homo sapiens

<400> 413

Arg Asn Gly Lys Asp Gln Asp Gly Asp Gln Ala Pro
1 5 10

<210> 414
<211> 19
<212> PRT
<213> Homo sapiens

<400> 414

Ser Lys Ile Phe Lys Leu Gly Gly Arg Asp Ser Arg Ser Gly Ser Pro
1 5 10 15

Met Ala Arg

<210> 415
<211> 19
<212> PRT
<213> Homo sapiens

<400> 415

Ser Leu Pro Gln Lys Ser His Gly Arg Thr Gln Asp Glu Asn Pro Val
1 5 10 15

Val His Phe

<210> 416
<211> 12
<212> PRT
<213> Homo sapiens

<400> 416

Ser Pro Gly Lys Asn Ala Thr Gly Met Glu Val Gly
1 5 10

<210> 417
<211> 12
<212> PRT
<213> Homo sapiens

<400> 417

Ser Ser Tyr Ala Gly Gln Phe Arg Val Ile Gly Pro
1 5 10

<210> 418
<211> 9
<212> PRT
<213> Homo sapiens

<400> 418

Ser Trp Gly Ala Glu Gly Gln Arg Pro
1 5

<210> 419
<211> 10
<212> PRT
<213> Homo sapiens

<400> 419

Ser Trp Gly Ala Glu Gly Gln Arg Pro Gly
1 5 10

<210> 420
<211> 12

<212> PRT
<213> Homo sapiens

<400> 420

Thr Leu Arg Ile Arg Asn Val Arg Phe Ser Asp Glu
1 5 10

<210> 421
<211> 12
<212> PRT
<213> Homo sapiens

<400> 421

Val Gly Trp Tyr Arg Pro Pro Phe Ser Arg Val Val
1 5 10

<210> 422
<211> 12
<212> PRT
<213> Homo sapiens

<400> 422

Val Val His Leu Tyr Arg Asn Gly Lys Asp Gln Asp
1 5 10

<210> 423
<211> 8
<212> PRT
<213> Homo sapiens

<400> 423

Trp Gly Ala Glu Gly Gln Arg Pro
1 5

<210> 424
<211> 10
<212> PRT
<213> Homo sapiens

<400> 424

Trp Gly Ala Glu Gly Gln Arg Pro Gly Phe
1 5 10

<210> 425
<211> 5
<212> PRT
<213> Homo sapiens

<400> 425

Ala Ala Met Glu Leu
1 5

<210> 426
<211> 5
<212> PRT
<213> Homo sapiens

<400> 426

Ala Asp Ala Arg Met
1 5

<210> 427
<211> 5
<212> PRT
<213> Homo sapiens

<400> 427

Ala His Arg Glu Thr
1 5

<210> 428
<211> 15
<212> PRT
<213> Bacillus subtilis

<400> 428

Ala Leu Ala Val Leu His Phe Tyr Pro Asp Lys Gly Ala Lys Asn
1 5 10 15

<210> 429
<211> 21
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 429

Ala Leu Gly Gln Gly Pro Gln Phe Ile Phe Gln Thr Tyr Glu Glu Glu
1 5 10 15

Glu Arg Gln Arg Gly
20

<210> 430
<211> 21
<212> PRT
<213> Homo sapiens

<400> 430

Ala Leu Gly Gln Gly Pro Gln Phe Ile Phe Gln Tyr Tyr Glu Glu Glu
1 5 10 15

Glu Arg Gln Arg Gly
20

<210> 431
<211> 21
<212> PRT
<213> Homo sapiens

<400> 431

Ala Ser Thr Met Asp His Ala Arg His Gly Phe Leu Pro Arg His Arg
1 5 10 15

Asp Thr Gly Ile Leu
20

<210> 432
<211> 15
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 432

Asp Phe Ala Arg Val His Phe Ile Arg Ala Leu His Gly Ser Gly
1 5 10 15

<210> 433
<211> 15
<212> PRT
<213> Haemophilus influenzae

<400> 433

Asp Phe Ala Arg Val His Phe Ile Ser Ala Leu His Gly Ser Gly
1 5 10 15

<210> 434
<211> 21
<212> PRT
<213> Homo sapiens

<400> 434

Asp Pro Gly His Gly Leu Arg Leu Ile His Tyr Ser Tyr Gly Val Lys
1 5 10 15

Asp Thr Asp Lys Gly
20

<210> 435
<211> 21
<212> PRT
<213> Homo sapiens

<400> 435

Asp Pro Gly Leu Gly Leu Arg Leu Ile Tyr Phe Ser Tyr Asp Val Lys
1 5 10 15

Met Lys Glu Lys Gly
20

<210> 436
<211> 20
<212> PRT
<213> Homo sapiens

<400> 436

Gly Asn Phe Pro Asp Arg Phe Ser Gly His Gln Phe Pro Asn Tyr Ser
1 5 10 15

Ser Glu Leu Asn
20

<210> 437
<211> 19
<212> PRT
<213> Homo sapiens

<400> 437

Gly Gln Gly Pro Gln Phe Ile Phe Gln Tyr Tyr Glu Glu Glu Glu Arg
1 5 10 15

Gln Arg Gly

<210> 438
<211> 15
<212> PRT
<213> Homo sapiens

<400> 438

Gly Arg Ala Ser Asp Tyr Lys Ser Ala His Lys Gly Phe Lys Gly
1 5 10 15

<210> 439
<211> 18
<212> PRT
<213> Cavia porcellus

<400> 439

Gly Thr Leu Ser Lys Ile Phe Lys Leu Gly Gly Arg Asp Ser Arg Ser
1 5 10 15

Gly Ser

<210> 440
<211> 5
<212> PRT
<213> Homo sapiens

<400> 440

His Arg Thr Phe Glu
1 5

<210> 441
<211> 5
<212> PRT
<213> Homo sapiens

<400> 441

His Ser Tyr Gln Glu
1 5

<210> 442
<211> 6
<212> PRT
<213> Homo sapiens

<400> 442

Lys Thr Gly Gln Phe Leu
1 5

<210> 443
<211> 21
<212> PRT
<213> Homo sapiens

<400> 443

Lys Thr Arg Gly Gln Gln Val Thr Leu Arg Cys Ser Pro Lys Ser Gly
1 5 10 15

His Asp Thr Val Ser
20

<210> 444
<211> 20
<212> PRT
<213> Homo sapiens

<400> 444

Leu Val Lys Arg Thr Gly Glu Lys Val Phe Leu Glu Cys Val Gln Asp
1 5 10 15

Met Asp His Glu
20

<210> 445
<211> 16
<212> PRT
<213> Homo sapiens

<400> 445

Asn Ala Leu Leu Leu Gly Asp Ser Ala Leu Tyr Leu Cys Ala Ser Ser
1 5 10 15

<210> 446
<211> 24
<212> PRT
<213> Cavia porcellus

<400> 446

Pro Ala Arg Thr Ala His Tyr Gly Ser Leu Pro Gln Lys Ser Gly Arg
1 5 10 15

Ser Gln Asp Glu Asn Pro Val Val
20

<210> 447
<211> 18
<212> PRT
<213> Homo sapiens

<400> 447

Pro Lys Ser Gly His Asp Thr Val Ser Trp Tyr Gln Gln Ala Leu Gly
1 5 10 15

Gln Gly

<210> 448
<211> 19
<212> PRT
<213> Homo sapiens

<400> 448

Pro Asn Tyr Ser Ser Glu Leu Asn Val Asn Ala Leu Leu Leu Gly Asp
1 5 10 15

Ser Ala Leu

<210> 449
<211> 40
<212> PRT

<213> Homo sapiens

<400> 449

Pro Ser Gln Gly Lys Gly Arg Gly Leu Ser Leu Ser Arg Phe Ser Trp
1 5 10 15

Gly Ala Glu Gly Gln Arg Pro Gly Phe Gly Tyr Gly Gly Arg Ala Ser
20 25 30

Asp Tyr Lys Ser Ala His Lys Gly
35 40

<210> 450
<211> 5
<212> PRT
<213> Homo sapiens

<400> 450

Gln Ala Pro Glu Tyr
1 5

<210> 451
<211> 15
<212> PRT
<213> Mycobacterium avium

<400> 451

Gln Arg Cys Arg Val His Phe Leu Arg Asn Val Leu Ala Gln Val
1 5 10 15

<210> 452
<211> 15
<212> PRT
<213> Mycobacterium tuberculosis

<400> 452

Gln Arg Cys Arg Val His Phe Met Arg Asn Leu Tyr Thr Ala Val
1 5 10 15

<210> 453
<211> 19
<212> PRT
<213> Homo sapiens

<400> 453

Gln Tyr Tyr Glu Glu Glu Glu Arg Gln Arg Gly Asn Phe Pro Asp Arg
1 5 10 15

Phe Ser Gly

<210> 454
<211> 16
<212> PRT
<213> Homo sapiens

<400> 454

Ser His Gly Arg Thr Gln Asp Glu Asn Pro Val Val His Phe Phe Lys
1 5 10 15

<210> 455
<211> 20
<212> PRT
<213> Homo sapiens

<400> 455

Ser Lys Ile Phe Lys Leu Gly Gly Arg Asp Ser Arg Ser Gly Ser Pro
1 5 10 15

Met Ala Arg Arg
20

<210> 456
<211> 21
<212> PRT
<213> Homo sapiens

<400> 456

Ser Lys Lys Phe Leu Lys Ile Met Phe Ser Tyr Asn Asn Lys Glu Leu
1 5 10 15

Ile Ile Asn Glu Thr
20

<210> 457
<211> 19
<212> PRT
<213> Cavia porcellus

<400> 457

Ser Leu Ser Arg Phe Ser Trp Gly Ala Glu Gly Gln Lys Pro Gly Phe
1 5 10 15

Gly Tyr Gly

<210> 458
<211> 17
<212> PRT
<213> Homo sapiens

<400> 458

Ser Trp Gly Ala Glu Gly Gln Arg Pro Gly Phe Gly Tyr Gly Gly Arg
1 5 10 15

Ala

<210> 459
<211> 20
<212> PRT
<213> Homo sapiens

<400> 459

Ser Trp Tyr Gln Gln Ala Leu Gly Gln Gly Pro Gln Phe Ile Phe Gln
1 5 10 15

Tyr Tyr Glu Glu
20

<210> 460
<211> 22
<212> PRT
<213> Homo sapiens

<400> 460

Thr Ser Gly Val Thr Gln Ser Pro His Thr Leu Ile Lys Thr Arg Gly
1 5 10 15

Gln Gln Val Thr Leu Arg
20

<210> 461
<211> 15
<212> PRT
<213> Staphylococcus aureus

<400> 461

Val Leu Ala Arg Leu His Phe Tyr Arg Asn Asp Val His Lys Glu
1 5 10 15

<210> 462
<211> 5
<212> PRT
<213> Homo sapiens

<400> 462

Val Thr Leu Arg Ile
1 5

<210> 463
<211> 20

<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 463

Tyr Asp Glu Asn Pro Val Val His Phe Phe Lys Asn Ile Val Thr Pro
1 5 10 15

Arg Thr Pro Pro
20

<210> 464
<211> 15
<212> PRT
<213> Influenza A virus

<400> 464

Tyr Arg Asn Leu Val Trp Phe Ile Lys Lys Asn Thr Arg Tyr Pro
1 5 10 15

<210> 465
<211> 20
<212> PRT
<213> Homo sapiens

<400> 465

Ala Pro Lys Arg Gly Ser Gly Lys Asp Ser His His Pro Ala Arg Thr
1 5 10 15

Ala His Tyr Gly
20

<210> 466
<211> 20
<212> PRT
<213> Homo sapiens

<400> 466

Ala Ser Asp Tyr Lys Ser Ala His Lys Gly Phe Lys Gly Val Asp Ala
1 5 10 15

Gln Gly Thr Leu
20

<210> 467
<211> 23
<212> PRT
<213> Homo sapiens

<400> 467

Ala Thr Ala Ser Thr Met Asp His Ala Arg His Gly Phe Leu Pro Arg
1 5 10 15

His Arg Asp Thr Gly Ile Leu
20

<210> 468
<211> 45
<212> PRT
<213> Homo sapiens

<400> 468

Phe Gly Gly Asp Arg Gly Ala Pro Lys Arg Gly Ser Gly Lys Asp Ser
1 5 10 15

His His Pro Ala Arg Thr Ala His Tyr Gly Ser Leu Pro Gln Lys Ser
20 25 30

His Gly Arg Thr Gln Asp Glu Asn Pro Val Val His Phe
35 40 45

<210> 469
<211> 19
<212> PRT
<213> Homo sapiens

<400> 469

Gly Ala Pro Lys Arg Gly Ser Gly Lys Asp Ser His His Pro Ala Arg
1 5 10 15

Thr Ala His

<210> 470
<211> 18
<212> PRT
<213> Homo sapiens

<400> 470

Gly Phe Gly Tyr Gly Gly Arg Ala Ser Asp Tyr Lys Ser Ala His Lys
1 5 10 15

Gly Phe

<210> 471
<211> 15
<212> PRT
<213> Homo sapiens

<400> 471

His Lys Gly Phe Lys Gly Val Asp Ala Gln Gly Thr Leu Ser Lys
1 5 10 15

<210> 472
<211> 20
<212> PRT
<213> Homo sapiens

<400> 472

Ile Gly Arg Phe Phe Gly Gly Asp Arg Gly Ala Pro Lys Arg Gly Ser
1 5 10 15

Gly Lys Asp Ser
20

<210> 473
<211> 12
<212> PRT
<213> Cavia porcellus

<400> 473

Ile Val Thr Pro Arg Thr Pro Pro Pro Ser Gln Gly
1 5 10

<210> 474
<211> 20
<212> PRT
<213> Homo sapiens

<400> 474

Leu Cys Asn Met Tyr Lys Lys Asp Ser His His Pro Ala Arg Thr Ala
1 5 10 15

His Tyr Gly Ser
20

<210> 475
<211> 21
<212> PRT
<213> Homo sapiens

<400> 475

Leu Asp Ser Ile Gly Arg Phe Phe Gly Gly Asp Arg Gly Ala Pro Lys
1 5 10 15

Arg Gly Ser Gly Lys
20

<210> 476

<211> 19
<212> PRT
<213> Homo sapiens

<400> 476

Leu Gly Gln Gly Pro Glu Phe Leu Thr Tyr Phe Gln Asn Glu Ala Gln
1 5 10 15

Leu Lys Ser

<210> 477
<211> 20
<212> PRT
<213> Homo sapiens

<400> 477

Leu Pro Ser His Ala Arg Ser Gln Pro Gly Leu Cys Asn Met Tyr Lys
1 5 10 15

Lys Asp Ser His
20

<210> 478
<211> 19
<212> PRT
<213> Homo sapiens

<400> 478

Pro Arg His Arg Asp Thr Gly Ile Leu Asp Ser Ile Gly Arg Phe Phe
1 5 10 15

Gly Gly Asp

<210> 479
<211> 20
<212> PRT
<213> Homo sapiens

<400> 479

Pro Arg Thr Pro Pro Pro Ser Gln Gly Lys Gly Ala Glu Gly Gln Arg
1 5 10 15

Pro Gly Phe Gly
20

<210> 480
<211> 20
<212> PRT
<213> Homo sapiens

<400> 480

Arg Gly Ala Pro Lys Arg Gly Ser Gly Lys Val Pro Trp Leu Lys Pro
1 5 10 15

Gly Arg Ser Pro
20

<210> 481
<211> 20
<212> PRT
<213> Homo sapiens

<400> 481

Ser Leu Pro Gln Lys Ser His Gly Arg Thr Gln Asp Glu Asn Pro Val
1 5 10 15

Val His Phe Phe
20

<210> 482
<211> 20
<212> PRT
<213> Homo sapiens

<400> 482

Thr Gln Asp Glu Asn Pro Val Val His Phe Phe Lys Asn Ile Val Thr
1 5 10 15

Pro Arg Thr Pro
20

<210> 483
<211> 18
<212> PRT
<213> Homo sapiens

<400> 483

Thr Gln Asp Gln Asp Pro Asx Asx His Phe Phe Lys Asn Ile Val Thr
1 5 10 15

Pro Arg

<210> 484
<211> 20
<212> PRT
<213> Homo sapiens

<400> 484

Val Pro Trp Leu Lys Pro Gly Arg Ser Pro Leu Pro Ser His Ala Arg
1 5 10 15

Ser Gln Pro Gly
20

<210> 485
<211> 24
<212> PRT
<213> Homo sapiens

<400> 485

Val Thr Pro Arg Thr Pro Pro Pro Ser Gln Gly Lys Gly Arg Gly Leu
1 5 10 15

Ser Leu Ser Arg Phe Ser Trp Gly
20

<210> 486
<211> 19
<212> PRT
<213> Homo sapiens

<400> 486

Ala Pro Lys Arg Gly Ser Gly Lys Asp Ser His His Pro Ala Arg Thr
1 5 10 15

Ala His Tyr

<210> 487
<211> 27
<212> PRT
<213> Homo sapiens

<400> 487

Ala Ser Gln Lys Arg Pro Ser Gln Arg His Gly Ser Lys Tyr Leu Ala
1 5 10 15

Thr Ala Ser Thr Met Asp His Ala Arg His Gly
20 25

<210> 488
<211> 13
<212> PRT
<213> Homo sapiens

<400> 488

Asp Pro Val Val His Phe Phe Lys Asn Ile Val Thr Pro
1 5 10

<210> 489
<211> 19
<212> PRT
<213> Homo sapiens

<400> 489

Glu Gly Gln Arg Pro Gly Phe Gly Tyr Gly Gly Arg Ala Ser Asp Tyr
1 5 10 15

Lys Ser Ala

<210> 490
<211> 19
<212> PRT
<213> Homo sapiens

<400> 490

Phe Phe Lys Asn Ile Val Thr Pro Arg Thr Pro Pro Pro Ser Gln Gly
1 5 10 15

Lys Gly Arg

<210> 491
<211> 43
<212> PRT
<213> Homo sapiens

<400> 491

Phe Gly Gly Asp Arg Gly Ala Pro Lys Arg Gly Ser Gly Lys Asp Ser
1 5 10 15

His His Pro Ala Arg Thr Ala His Tyr Gly Ser Leu Pro Gln Lys Ser
20 25 30

His Gly Arg Thr Gln Asp Glu Asn Pro Val Val
35 40

<210> 492
<211> 12
<212> PRT
<213> Mus musculus

<400> 492

Phe Lys Asn Ile Val Thr Pro Arg Thr Pro Pro Pro
1 5 10

<210> 493
<211> 40

<212> PRT
<213> Homo sapiens

<400> 493

Gly Leu Ser Leu Ser Arg Phe Ser Trp Gly Ala Glu Gly Gln Arg Pro
1 5 10 15

Gly Phe Gly Tyr Gly Gly Arg Ala Ser Asp Tyr Lys Ser Ala His Lys
20 25 30

Gly Phe Lys Gly Val Asp Ala Gln
35 40

<210> 494
<211> 19
<212> PRT
<213> Homo sapiens

<400> 494

Gly Arg Ala Ser Asp Tyr Lys Ser Ala His Lys Gly Phe Lys Gly Val
1 5 10 15

Asp Ala Gln

<210> 495
<211> 17
<212> PRT
<213> Homo sapiens

<400> 495

His His Pro Ala Arg Thr Ala His Tyr Gly Ser Leu Pro Gln Lys Ser
1 5 10 15

His

<210> 496
<211> 19
<212> PRT
<213> Homo sapiens

<400> 496

Ile Gly Arg Phe Phe Gly Gly Asp Arg Gly Ala Pro Lys Arg Gly Ser
1 5 10 15

Gly Lys Asp

<210> 497

<211> 19
<212> PRT
<213> Homo sapiens

<400> 497

Lys Gly Phe Lys Gly Val Asp Ala Gln Gly Thr Leu Ser Lys Ile Phe
1 5 10 15

Lys Leu Gly

<210> 498
<211> 24
<212> PRT
<213> Homo sapiens

<400> 498

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

Arg Gly Leu Ser Leu Ser Arg Phe
20

<210> 499
<211> 29
<212> PRT
<213> Homo sapiens

<400> 499

Lys Arg Gly Ser Gly Lys Asp Ser His His Pro Ala Arg Thr Ala His
1 5 10 15

Tyr Gly Ser Leu Pro Gln Lys Ser His Gly Arg Thr Gln
20 25

<210> 500
<211> 8
<212> PRT
<213> Homo sapiens

<400> 500

Leu Gly Arg Ala Gly Leu Thr Tyr
1 5

<210> 501
<211> 19
<212> PRT
<213> Homo sapiens

<400> 501

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

1 5 10 15

Phe Gly Tyr

<210> 502
<211> 18
<212> PRT
<213> Homo sapiens

<400> 502

Pro Gly Phe Gly Tyr Gly Gly Arg Ala Ser Asp Tyr Lys Ser Ala His
1 5 10 15

Lys Gly

<210> 503
<211> 19
<212> PRT
<213> Homo sapiens

<400> 503

Pro Pro Pro Ser Gln Gly Lys Gly Arg Gly Leu Ser Leu Ser Arg Phe
1 5 10 15

Ser Trp Gly

<210> 504
<211> 33
<212> PRT
<213> Oryctolagus cuniculus

<400> 504

Pro Pro Pro Ser Gln Gly Lys Gly Arg Gly Thr Val Leu Ser Arg Phe
1 5 10 15

Ser Trp Gly Ala Glu Gly Gln Lys Pro Gly Phe Gly Tyr Gly Gly Arg
20 25 30

Ala

<210> 505
<211> 17
<212> PRT
<213> Homo sapiens

<400> 505

Gln Asp Glu Asn Pro Val Val His Phe Phe Lys Asn Ile Val Thr Pro
1 5 10 15

Arg

<210> 506
<211> 23
<212> PRT
<213> Homo sapiens

<400> 506

Gln Asp Glu Asn Pro Val Val His Phe Phe Lys Asn Ile Val Thr Pro
1 5 10 15

Arg Thr Pro Pro Pro Ser Gln
20

<210> 507
<211> 27
<212> PRT
<213> Homo sapiens

<400> 507

Arg Ala Ser Asp Tyr Lys Ser Ala His Lys Gly Phe Lys Gly Val Asp
1 5 10 15

Ala Gln Gly Thr Leu Ser Lys Ile Phe Lys Leu
20 25

<210> 508
<211> 26
<212> PRT
<213> Homo sapiens

<400> 508

Arg Phe Phe Gly Gly Asp Arg Gly Ala Pro Lys Arg Gly Ser Gly Lys
1 5 10 15

Asp Ser His His Pro Ala Arg Thr Ala His
20 25

<210> 509
<211> 26
<212> PRT
<213> Homo sapiens

<400> 509

Arg Gly Leu Ser Leu Ser Arg Phe Ser Trp Gly Ala Glu Gly Gln Arg
1 5 10 15

Pro Gly Phe Gly Tyr Gly Gly Arg Ala Ser
20 25

<210> 510
<211> 30
<212> PRT
<213> Homo sapiens

<400> 510

Arg His Gly Phe Leu Pro Arg His Arg Asp Thr Gly Ile Leu Asp Ser
1 5 10 15

Ile Gly Arg Phe Phe Gly Gly Asp Arg Gly Ala Pro Lys Arg
20 25 30

<210> 511
<211> 19
<212> PRT
<213> Homo sapiens

<400> 511

Arg His Arg Asp Thr Gly Ile Leu Asp Ser Ile Gly Arg Phe Phe Gly
1 5 10 15

Gly Asp Arg

<210> 512
<211> 28
<212> PRT
<213> Homo sapiens

<400> 512

Arg Thr Ala His Tyr Gly Ser Leu Pro Gln Lys Ser His Gly Arg Thr
1 5 10 15

Gln Asp Glu Asn Pro Val Val His Phe Phe Lys Asn
20 25

<210> 513
<211> 17
<212> PRT
<213> Homo sapiens

<400> 513

Ser Leu Pro Gln Lys Ser His Gly Arg Thr Gln Asp Glu Asn Pro Val
1 5 10 15

Val

<210> 514
<211> 15
<212> PRT
<213> Homo sapiens

<400> 514

Ser Ser Leu Gly Arg Ala Gly Leu Thr Tyr Glu Gln Tyr Phe Gly
1 5 10 15

<210> 515
<211> 31
<212> PRT
<213> Homo sapiens

<400> 515

Thr Ala Ser Thr Met Asp His Ala Arg His Gly Phe Leu Pro Arg His
1 5 10 15

Arg Asp Thr Gly Ile Leu Asp Ser Ile Gly Arg Phe Phe Gly Gly
20 25 30

<210> 516
<211> 21
<212> PRT
<213> Homo sapiens

<400> 516

Ala His Ser Leu Glu Arg Val Cys His Cys Leu Gly Lys Trp Leu Gly
1 5 10 15

His Pro Asp Lys Phe
20

<210> 517
<211> 21
<212> PRT
<213> Homo sapiens

<400> 517

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

Gly Leu Ser Ala Thr
20

<210> 518
<211> 14
<212> PRT
<213> Homo sapiens

<400> 518

Cys Asn Met Tyr Lys Asp Ser His His Pro Ala Arg Thr Ala
1 5 10

<210> 519
<211> 20
<212> PRT
<213> Homo sapiens

<400> 519

Cys Gln Ser Ile Ala Phe Pro Ser Lys Thr Ser Ala Ser Ile Gly Ser
1 5 10 15

Leu Cys Ala Asp
20

<210> 520
<211> 21
<212> PRT
<213> Homo sapiens

<400> 520

Asp Gln Ala Pro Glu Tyr Arg Gly Arg Thr Glu Leu Leu Lys Asp Ala
1 5 10 15

Ile Gly Glu Gly Lys
20

<210> 521
<211> 20
<212> PRT
<213> Homo sapiens

<400> 521

Glu Gly Lys Val Thr Leu Arg Ile Arg Asn Val Arg Phe Ser Asp Glu
1 5 10 15

Gly Gly Phe Thr
20

<210> 522
<211> 21
<212> PRT
<213> Homo sapiens

<400> 522

Glu Leu Lys Val Glu Asp Pro Phe Tyr Trp Val Ser Pro Gly Val Leu
1 5 10 15

Val Leu Leu Ala Val

20

<210> 523
<211> 21
<212> PRT
<213> Homo sapiens

<400> 523

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

Met Glu Val Gly Trp
20

<210> 524
<211> 21
<212> PRT
<213> Homo sapiens

<400> 524

Glu Tyr Leu Ile Asn Val Ile His Ala Phe Gln Tyr Val Ile Tyr Gly
1 5 10 15

Thr Ala Ser Phe Phe
20

<210> 525
<211> 21
<212> PRT
<213> Homo sapiens

<400> 525

Phe Phe Gly Val Ala Leu Phe Cys Gly Cys Gly His Glu Ala Leu Thr
1 5 10 15

Gly Thr Glu Lys Leu
20

<210> 526
<211> 19
<212> PRT
<213> Homo sapiens

<400> 526

Phe Gly Gly Asp Arg Gly Ala Pro Lys Arg Gly Ser Gly Lys Val Pro
1 5 10 15

Trp Leu Lys

<210> 527
<211> 21
<212> PRT
<213> Homo sapiens

<400> 527

Phe Lys Gly Val Asp Ala Gln Gly Thr Leu Ser Lys Ile Phe Lys Leu
1 5 10 15

Gly Gly Arg Asp Ser
20

<210> 528
<211> 21
<212> PRT
<213> Homo sapiens

<400> 528

Phe Met Ile Ala Ala Thr Tyr Asn Phe Ala Val Leu Lys Leu Met Gly
1 5 10 15

Arg Gly Thr Lys Phe
20

<210> 529
<211> 19
<212> PRT
<213> Homo sapiens

<400> 529

Phe Ser Arg Val Val His Leu Tyr Arg Asn Gly Lys Asp Gln Asp Gly
1 5 10 15

Asp Gln Ala

<210> 530
<211> 21
<212> PRT
<213> Homo sapiens

<400> 530

Phe Ser Trp Gly Ala Glu Gly Gln Arg Pro Gly Phe Gly Tyr Gly Gly
1 5 10 15

Arg Ala Ser Asp Tyr
20

<210> 531
<211> 20
<212> PRT

<213> Homo sapiens

<400> 531

Gly Ala Pro Lys Arg Gly Ser Gly Lys Asp Ser His His Pro Ala Arg
1 5 10 15

Thr Ala His Tyr
20

<210> 532
<211> 21
<212> PRT
<213> Homo sapiens

<400> 532

Gly Cys Gly His Glu Ala Leu Thr Gly Thr Glu Lys Leu Ile Glu Thr
1 5 10 15

Tyr Phe Ser Lys Asn
20

<210> 533
<211> 21
<212> PRT
<213> Homo sapiens

<400> 533

Gly Phe Leu Pro Arg His Arg Asp Thr Gly Ile Leu Asp Ser Ile Gly
1 5 10 15

Arg Phe Phe Gly Gly
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<210> 534
<211> 21
<212> PRT
<213> Homo sapiens

<400> 534

Gly Phe Thr Cys Phe Phe Arg Asp His Ser Tyr Gln Glu Glu Ala Ala
1 5 10 15

Met Glu Leu Lys Val
20

<210> 535
<211> 21
<212> PRT
<213> Homo sapiens

<400> 535

Gly Phe Tyr Thr Thr Gly Ala Val Arg Gln Ile Phe Gly Asp Tyr Lys
1 5 10 15

Thr Thr Ile Cys Gly
20

<210> 536
<211> 21
<212> PRT
<213> Homo sapiens

<400> 536

Gly Ile Leu Asp Ser Ile Gly Arg Phe Phe Gly Gly Asp Arg Gly Ala
1 5 10 15

Pro Lys Arg Gly Ser
20

<210> 537
<211> 21
<212> PRT
<213> Homo sapiens

<400> 537

Gly Gln Phe Arg Val Ile Gly Pro Arg His Pro Ile Arg Ala Leu Val
1 5 10 15

Gly Asp Glu Val Glu
20

<210> 538
<211> 21
<212> PRT
<213> Homo sapiens

<400> 538

Gly Arg Gly Ser Arg Gly Gln His Gln Ala His Ser Leu Glu Arg Val
1 5 10 15

Cys His Cys Leu Gly
20

<210> 539
<211> 21
<212> PRT
<213> Homo sapiens

<400> 539

Gly Arg Ser Pro Leu Pro Ser His Ala Arg Ser Gln Pro Gly Leu Cys
1 5 10 15

Asn Met Tyr Lys Asp
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<210> 540
<211> 20
<212> PRT
<213> Homo sapiens

<400> 540

Gly Val Leu Pro Trp Asn Ala Phe Pro Gly Lys Val Cys Gly Ser Asn
1 5 10 15

Leu Leu Ser Ile
20

<210> 541
<211> 21
<212> PRT
<213> Homo sapiens

<400> 541

His Cys Leu Gly Lys Trp Leu Gly His Pro Asp Lys Phe Val Gly Ile
1 5 10 15

Thr Tyr Ala Leu Thr
20

<210> 542
<211> 20
<212> PRT
<213> Homo sapiens

<400> 542

His Gly Ser Lys Tyr Leu Ala Thr Ala Ser Thr Met Asp His Ala Arg
1 5 10 15

His Gly Phe Leu
20

<210> 543
<211> 12
<212> PRT
<213> Homo sapiens

<400> 543

His His Pro Ala Arg Thr Ala His Tyr Gly Ser Leu
1 5 10

<210> 544

<211> 21
<212> PRT
<213> Homo sapiens

<400> 544

His Pro Ile Arg Ala Leu Val Gly Asp Glu Val Glu Leu Pro Cys Arg
1 5 10 15

Ile Ser Pro Gly Lys
20

<210> 545
<211> 21
<212> PRT
<213> Homo sapiens

<400> 545

Ile Thr Val Gly Leu Val Phe Leu Cys Leu Gln Tyr Arg Leu Arg Gly
1 5 10 15

Lys Leu Arg Ala Glu
20

<210> 546
<211> 21
<212> PRT
<213> Homo sapiens

<400> 546

Lys Gly Arg Gly Leu Ser Leu Ser Arg Phe Ser Trp Gly Ala Glu Gly
1 5 10 15

Gln Arg Pro Gly Phe
20

<210> 547
<211> 21
<212> PRT
<213> Homo sapiens

<400> 547

Lys Thr Thr Ile Cys Gly Lys Gly Leu Ser Ala Thr Val Thr Gly Gly
1 5 10 15

Gln Lys Gly Arg Gly
20

<210> 548
<211> 22
<212> PRT
<213> Homo sapiens

<400> 548

Leu Asp Ser Ile Gly Arg Phe Phe Gly Gly Asp Arg Gly Ala Pro Lys
1 5 10 15

Arg Gly Ser Gly Lys Asp
20

<210> 549
<211> 21
<212> PRT
<213> Homo sapiens

<400> 549

Leu Gln Tyr Arg Leu Arg Gly Lys Leu Arg Ala Glu Ile Glu Asn Leu
1 5 10 15

His Arg Thr Phe Asp
20

<210> 550
<211> 21
<212> PRT
<213> Homo sapiens

<400> 550

Leu Ser Lys Ile Phe Lys Leu Gly Gly Arg Asp Ser Arg Ser Gly Ser
1 5 10 15

Pro Met Ala Arg Arg
20

<210> 551
<211> 21
<212> PRT
<213> Homo sapiens

<400> 551

Leu Tyr Gly Ala Leu Leu Leu Ala Glu Gly Phe Tyr Thr Thr Gly Ala
1 5 10 15

Val Arg Gln Ile Phe
20

<210> 552
<211> 21
<212> PRT
<213> Homo sapiens

<400> 552

Met Tyr Lys Asp Ser His His Pro Ala Arg Thr Ala His Tyr Gly Ser
1 5 10 15

Leu Pro Gln Lys Ser
20

<210> 553
<211> 21
<212> PRT
<213> Homo sapiens

<400> 553

Pro Gly Phe Gly Tyr Gly Gly Arg Ala Ser Asp Tyr Lys Ser Ala His
1 5 10 15

Lys Gly Phe Lys Gly
20

<210> 554
<211> 21
<212> PRT
<213> Homo sapiens

<400> 554

Pro Gly Lys Asn Ala Thr Gly Met Glu Val Gly Trp Tyr Arg Pro Pro
1 5 10 15

Phe Ser Arg Val Val
20

<210> 555
<211> 16
<212> PRT
<213> Homo sapiens

<400> 555

Pro Lys Arg Gly Ser Gly Lys Asp Ser His His Pro Ala Arg Thr Ala
1 5 10 15

<210> 556
<211> 16
<212> PRT
<213> Homo sapiens

<400> 556

Pro Lys Arg Gly Ser Gly Lys Val Pro Trp Leu Lys Pro Gly Arg Ser
1 5 10 15

<210> 557
<211> 21
<212> PRT

<213> Homo sapiens

<400> 557

Pro Gln Lys Ser His Gly Arg Thr Gln Asp Glu Asn Pro Val Val His
1 5 10 15

Phe Phe Lys Asn Ile
20

<210> 558
<211> 21
<212> PRT
<213> Homo sapiens

<400> 558

Pro Arg Thr Pro Pro Pro Ser Gln Gly Lys Gly Arg Gly Leu Ser Leu
1 5 10 15

Ser Arg Phe Ser Trp
20

<210> 559
<211> 21
<212> PRT
<213> Homo sapiens

<400> 559

Arg Ala Glu Ile Glu Asn Leu His Arg Thr Phe Asp Pro His Phe Leu
1 5 10 15

Arg Val Pro Cys Trp
20

<210> 560
<211> 21
<212> PRT
<213> Homo sapiens

<400> 560

Arg Asn Val Arg Phe Ser Asp Glu Gly Gly Phe Thr Cys Phe Phe Arg
1 5 10 15

Asp His Ser Tyr Gln
20

<210> 561
<211> 21
<212> PRT
<213> Homo sapiens

<400> 561

Ser Asp Tyr Lys Ser Ala His Lys Gly Phe Lys Gly Val Asp Ala Gln
1 5 10 15

Gly Thr Leu Ser Lys
20

<210> 562
<211> 21
<212> PRT
<213> Homo sapiens

<400> 562

Ser Gly Lys Val Pro Trp Leu Lys Pro Gly Arg Ser Pro Leu Pro Ser
1 5 10 15

His Ala Arg Ser Gln
20

<210> 563
<211> 11
<212> PRT
<213> Homo sapiens

<400> 563

Ser Ile Gly Arg Phe Phe Gly Gly Asp Arg Gly
1 5 10

<210> 564
<211> 21
<212> PRT
<213> Homo sapiens

<400> 564

Ser Leu Cys Ala Asp Ala Arg Met Tyr Gly Val Leu Pro Trp Asn Ala
1 5 10 15

Phe Pro Gly Lys Val
20

<210> 565
<211> 20
<212> PRT
<213> Homo sapiens

<400> 565

Ser Tyr Gln Glu Glu Ala Ala Met Glu Leu Lys Val Glu Asp Pro Phe
1 5 10 15

Tyr Trp Val Ser
20

<210> 566
<211> 21
<212> PRT
<213> Homo sapiens

<400> 566

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

Ile Arg Asn Val Arg
20

<210> 567
<211> 20
<212> PRT
<213> Homo sapiens

<400> 567

Thr Phe Asp Pro His Phe Leu Arg Val Pro Cys Trp Lys Ile Thr Leu
1 5 10 15

Phe Val Ile Val
20

<210> 568
<211> 21
<212> PRT
<213> Homo sapiens

<400> 568

Thr Pro Arg Thr Pro Pro Pro Ser Gln Gly Lys Gly Ala Glu Gly Gln
1 5 10 15

Arg Pro Gly Phe Gly
20

<210> 569
<211> 21
<212> PRT
<213> Homo sapiens

<400> 569

Val Ala Leu Ile Ile Cys Tyr Asn Trp Leu His Arg Arg Leu Ala Gly
1 5 10 15

Gln Phe Leu Glu Glu
20

<210> 570

<211> 21
<212> PRT
<213> Homo sapiens

<400> 570

Val Phe Ala Cys Ser Ala Val Pro Val Tyr Ile Tyr Phe Asn Thr Trp
1 5 10 15

Thr Thr Cys Gln Ser
20

<210> 571
<211> 21
<212> PRT
<213> Homo sapiens

<400> 571

Val Ile Val Pro Val Leu Gly Pro Leu Val Ala Leu Ile Ile Cys Tyr
1 5 10 15

Asn Trp Leu His Arg
20

<210> 572
<211> 21
<212> PRT
<213> Homo sapiens

<400> 572

Tyr Phe Ser Lys Asn Tyr Gln Asp Tyr Glu Tyr Leu Ile Asn Val Ile
1 5 10 15

His Ala Phe Gln Tyr
20

<210> 573
<211> 21
<212> PRT
<213> Homo sapiens

<400> 573

Tyr Ile Tyr Phe Asn Thr Trp Thr Thr Cys Gln Ser Ile Ala Phe Pro
1 5 10 15

Ser Lys Thr Ser Ala
20

<210> 574
<211> 20
<212> PRT
<213> Homo sapiens

<400> 574

Tyr Asn Trp Leu His Arg Arg Leu Ala Gly Gln Phe Leu Glu Glu Leu
1 5 10 15

Arg Asn Pro Phe
20

<210> 575
<211> 21
<212> PRT
<213> Homo sapiens

<400> 575

Tyr Arg Asn Gly Lys Asp Gln Asp Gly Asp Gln Ala Pro Glu Tyr Arg
1 5 10 15

Gly Arg Thr Glu Leu
20

<210> 576
<211> 32
<212> PRT
<213> Homo sapiens

<400> 576

Ala Ala Phe Val Gly Ala Ala Ala Thr Leu Val Ser Leu Leu Thr Phe
1 5 10 15

Met Ile Ala Ala Thr Tyr Asn Phe Ala Val Leu Lys Leu Met Gly Arg
20 25 30

<210> 577
<211> 14
<212> PRT
<213> Mus musculus

<400> 577

Ala Cys Ser Ala Val Thr Val Tyr Ile Tyr Phe Asn Thr Trp
1 5 10

<210> 578
<211> 19
<212> PRT
<213> Homo sapiens

<400> 578

Ala Ser Asp Tyr Lys Ser Ala His Lys Gly Phe Lys Gly Val Asp Ala
1 5 10 15

Gln Gly Thr

<210> 579
<211> 20
<212> PRT
<213> Homo sapiens

<400> 579

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

Gly Leu Ser Ala
20

<210> 580
<211> 16
<212> PRT
<213> Mus musculus

<400> 580

Asp Tyr Lys Thr Thr Ile Cys Gly Lys Gly Leu Ser Ala Thr Val Thr
1 5 10 15

<210> 581
<211> 31
<212> PRT
<213> Homo sapiens

<400> 581

Phe Gly Val Ala Leu Phe Cys Gly Cys Glu Val Glu Ala Leu Thr Gly
1 5 10 15

Thr Glu Lys Leu Ile Glu Thr Tyr Phe Ser Lys Asn Tyr Gln Asp
20 25 30

<210> 582
<211> 19
<212> PRT
<213> Homo sapiens

<400> 582

Phe Lys Gly Val Asp Ala Gln Gly Thr Leu Ser Lys Ile Phe Lys Leu
1 5 10 15

Gly Gly Arg

<210> 583
<211> 14
<212> PRT

<213> Mus musculus

<400> 583

Phe Ser Lys Asn Tyr Gln Asp Tyr Glu Tyr Leu Ile Asn Val
1 5 10

<210> 584
<211> 19
<212> PRT
<213> Homo sapiens

<400> 584

Gly Leu Arg Leu Ile His Tyr Ser Val Gly Ala Gly Ile Thr Asp Gln
1 5 10 15

Gly Glu Val

<210> 585
<211> 40
<212> PRT
<213> Homo sapiens

<400> 585

Gly Ser Lys Tyr Leu Ala Thr Ala Ser Thr Met Asp His Ala Arg His
1 5 10 15

Gly Phe Leu Pro Arg His Arg Asp Thr Gly Ile Leu Asp Ser Ile Gly
20 25 30

Arg Phe Phe Gly Gly Asp Arg Gly
35 40

<210> 586
<211> 32
<212> PRT
<213> Homo sapiens

<400> 586

Gly Thr Ala Ser Phe Phe Phe Leu Tyr Gly Ala Leu Leu Leu Ala Tyr
1 5 10 15

Gly Phe Tyr Thr Thr Gly Ala Val Arg Gln Ile Phe Gly Asp Tyr Lys
20 25 30

<210> 587
<211> 19
<212> PRT
<213> Homo sapiens

<400> 587

His His Pro Ala Arg Thr Ala His Tyr Gly Ser Leu Pro Gln Lys Ser
1 5 10 15

His Gly Arg

<210> 588
<211> 29
<212> PRT
<213> Homo sapiens

<400> 588

Ile Gly Arg Phe Phe Gly Gly Asp Arg Gly Ala Pro Lys Arg Gly Ser
1 5 10 15

Gly Lys Asp Ser His His Pro Ala Arg Thr Ala His Tyr
20 25

<210> 589
<211> 32
<212> PRT
<213> Homo sapiens

<400> 589

Lys Gly Arg Gly Ser Arg Gly Gln His Gln Ala His Ser Leu Glu Arg
1 5 10 15

Val Cys His Cys Leu Gly Cys Trp Leu Gly His Pro Asp Lys Phe Val
20 25 30

<210> 590
<211> 32
<212> PRT
<213> Homo sapiens

<400> 590

Lys Val Cys Gly Ser Asn Leu Leu Ser Ile Cys Lys Thr Ala Glu Phe
1 5 10 15

Gln Met Thr Phe His Leu Phe Ile Ala Ala Phe Val Gly Ala Ala Ala
20 25 30

<210> 591
<211> 15
<212> PRT
<213> Mus musculus

<400> 591

Leu Phe Ile Ala Ala Phe Val Gly Ala Ala Ala Thr Leu Val Ser
1 5 10 15

<210> 592
<211> 32
<212> PRT
<213> Homo sapiens

<400> 592

Leu Gly His Pro Asp Lys Phe Val Gly Ile Thr Tyr Ala Leu Thr Val
1 5 10 15

Val Trp Leu Leu Val Phe Ala Cys Ser Ala Val Pro Val Tyr Ile Tyr
20 25 30

<210> 593
<211> 31
<212> PRT
<213> Homo sapiens

<400> 593

Leu Leu Glu Cys Cys Ala Arg Cys Leu Val Gly Ala Pro Phe Ala Ser
1 5 10 15

Leu Val Ala Thr Gly Leu Cys Phe Phe Gly Val Ala Leu Phe Cys
20 25 30

<210> 594
<211> 35
<212> PRT
<213> Mus musculus

<400> 594

Pro Trp Asn Ala Phe Pro Gly Lys Val Cys Gly Ser Asn Leu Leu Ser
1 5 10 15

Ile Cys Lys Thr Ala Glu Phe Gln Met Thr Phe His Leu Phe Ile Ala
20 25 30

Ala Phe Val
35

<210> 595
<211> 20
<212> PRT
<213> Homo sapiens

<400> 595

Gln Asp Glu Asn Pro Val Val His Phe Phe Lys Asn Ile Val Thr Pro
1 5 10 15

Arg Thr Pro Pro

20

<210> 596
<211> 31
<212> PRT
<213> Homo sapiens

<400> 596

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

Ala Thr Val Thr Gly Gly Gln Lys Gly Arg Gly Ser Arg Gly Gln
20 25 30

<210> 597
<211> 32
<212> PRT
<213> Homo sapiens

<400> 597

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

Leu Pro Trp Asn Ala Phe Phe Gly Lys Val Cys Gly Ser Asn Leu Leu
20 25 30

<210> 598
<211> 32
<212> PRT
<213> Homo sapiens

<400> 598

Ser Ala Val Pro Val Tyr Ile Tyr Phe Asn Thr Trp Thr Thr Cys Gln
1 5 10 15

Ser Ile Ala Ala Pro Cys Lys Thr Ser Ala Ser Ile Gly Thr Leu Cys
20 25 30

<210> 599
<211> 15
<212> PRT
<213> Mus musculus

<400> 599

Thr Val Thr Gly Gly Gln Lys Gly Arg Gly Ser Arg Gly Gln His
1 5 10 15

<210> 600
<211> 32
<212> PRT
<213> Homo sapiens

<400> 600

Tyr Phe Ser Lys Asn Tyr Gln Asp Tyr Glu Tyr Leu Ile Asn Val Ile
1 5 10 15

His Ala Phe Gln Tyr Val Ile Tyr Gly Thr Ala Ser Phe Phe Phe Leu
20 25 30

<210> 601
<211> 12
<212> PRT
<213> Homo sapiens

<400> 601

Pro Val Val His Phe Phe Lys Asn Ile Val Thr Pro
1 5 10

<210> 602
<211> 9
<212> PRT
<213> Homo sapiens

<400> 602

Lys Val Glu Asp Pro Phe Tyr Trp Val
1 5

<210> 603
<211> 11
<212> PRT
<213> Homo sapiens

<400> 603

Pro Thr Arg Ala Pro Ser Gly Pro Arg Pro Pro
1 5 10

<210> 604
<211> 11
<212> PRT
<213> Homo sapiens

<400> 604

Arg Arg Arg Glu Gly Pro Asp Arg Ser Pro Arg
1 5 10

<210> 605
<211> 15
<212> PRT
<213> Human adenovirus

<400> 605

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

1 5 10 15

<210> 606
<211> 15
<212> PRT
<213> Pseudomonas aeruginosa

<400> 606

Asp Arg Leu Leu Met Leu Phe Ala Lys Asp Val Val Ser Arg Asn
1 5 10 15

<210> 607
<211> 15
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 607

Glu Asn Pro Val Val His Tyr Phe Arg Asn Ile Val Thr Pro Arg
1 5 10 15

<210> 608
<211> 15
<212> PRT
<213> Human herpesvirus

<400> 608

Phe Arg Gln Leu Val His Phe Val Arg Asp Phe Ala Gln Leu Leu
1 5 10 15

<210> 609
<211> 13
<212> PRT
<213> Herpes simplex virus

<400> 609

Gly Gly Arg Arg Leu Phe Phe Val Lys Ala His Val Arg
1 5 10

<210> 610
<211> 15
<212> PRT
<213> Mammalian orthoreovirus

<400> 610

Met Ala Arg Ala Ala Phe Leu Phe Lys Thr Val Gly Phe Gly Gly
1 5 10 15

<210> 611
<211> 9

<212> PRT
<213> Homo sapiens

<400> 611

Lys Leu Ile Glu Thr Tyr Phe Ser Lys
1 5

<210> 612
<211> 9
<212> PRT
<213> Saccharomyces cerevisiae

<400> 612

Lys Leu Val Glu Thr Tyr Ile Ser Lys
1 5

<210> 613
<211> 21
<212> PRT
<213> Homo sapiens

<400> 613

Ala Ala Gly Arg Gly Leu Gln Leu Leu Phe Tyr Ser Ile Gly Ile Asp
1 5 10 15

Gln Ile Ser Ser Glu
20

<210> 614
<211> 21
<212> PRT
<213> Homo sapiens

<400> 614

Ala Leu Gly Gln Gly Pro Glu Phe Leu Thr Tyr Phe Asn Tyr Glu Ala
1 5 10 15

Gln Pro Asp Lys Ser
20

<210> 615
<211> 21
<212> PRT
<213> Homo sapiens

<400> 615

Ala Leu Gly Gln Gly Pro Glu Phe Leu Thr Tyr Phe Asn Tyr Glu Ala
1 5 10 15

Gln Gln Asp Lys Ser
20

<210> 616
<211> 21
<212> PRT
<213> Homo sapiens

<400> 616

Ala Leu Gly Gln Gly Pro Glu Phe Leu Thr Tyr Phe Gln Asn Glu Ala
1 5 10 15

Gln Leu Asp Lys Ser
20

<210> 617
<211> 21
<212> PRT
<213> Homo sapiens

<400> 617

Asp Leu Gly His Gly Leu Arg Leu Ile His Tyr Ser Tyr Gly Val Gln
1 5 10 15

Asp Thr Asn Lys Gly
20

<210> 618
<211> 21
<212> PRT
<213> Homo sapiens

<400> 618

Asp Leu Gly Leu Gly Leu Arg Leu Ile His Tyr Ser Asn Thr Ala Gly
1 5 10 15

Thr Thr Gly Lys Gly
20

<210> 619
<211> 21
<212> PRT
<213> Homo sapiens

<400> 619

Asp Pro Gly Glu Gly Pro Val Leu Leu Ile Ala Leu Tyr Lys Ala Gly
1 5 10 15

Glu Leu Thr Ser Asn
20

<210> 620

<211> 21
<212> PRT
<213> Homo sapiens

<400> 620

Asp Pro Gly Lys Gly Pro Glu Phe Leu Phe Thr Leu Tyr Ser Ala Gly
1 5 10 15

Glu Glu Lys Glu Lys
20

<210> 621
<211> 21
<212> PRT
<213> Homo sapiens

<400> 621

Asp Pro Gly Lys Ser Leu Glu Ser Leu Phe Val Leu Leu Ser Asn Gly
1 5 10 15

Ala Val Lys Gln Glu
20

<210> 622
<211> 21
<212> PRT
<213> Homo sapiens

<400> 622

Asp Pro Gly Met Glu Leu His Leu Ile His Tyr Ser Tyr Gly Val Asn
1 5 10 15

Ser Thr Glu Lys Gly
20

<210> 623
<211> 21
<212> PRT
<213> Homo sapiens

<400> 623

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

Ile Thr Asp Lys Gly
20

<210> 624
<211> 21
<212> PRT
<213> Homo sapiens

<400> 624

Asp Pro Gly Met Gly Leu Arg Leu Ile His Tyr Ser Val Gly Ala Gly
1 5 10 15

Ile Thr Asp Gln Gly
20

<210> 625
<211> 21
<212> PRT
<213> Homo sapiens

<400> 625

Asp Pro Gly Met Gly Leu Arg Leu Ile His Tyr Ser Val Gly Glu Gly
1 5 10 15

Thr Thr Ala Lys Gly
20

<210> 626
<211> 21
<212> PRT
<213> Homo sapiens

<400> 626

Asp Pro Gly Met Gly Leu Arg Arg Ile His Tyr Ser Val Ala Ala Gly
1 5 10 15

Ile Thr Asp Lys Gly
20

<210> 627
<211> 21
<212> PRT
<213> Homo sapiens

<400> 627

Asp Pro Gly Arg Gly Pro Val Phe Leu Leu Leu Ile Arg Glu Asn Glu
1 5 10 15

Lys Glu Lys Arg Lys
20

<210> 628
<211> 21
<212> PRT
<213> Homo sapiens

<400> 628

Asp Ser Lys Lys Phe Leu Lys Ile Met Phe Ser Tyr Asn Asn Lys Glu
1 5 10 15

Leu Ile Ile Asn Glu
20

<210> 629
<211> 21
<212> PRT
<213> Homo sapiens

<400> 629

Asp Thr Gly Arg Gly Pro Val Ser Leu Thr Ile Met Thr Phe Ser Glu
1 5 10 15

Asn Thr Lys Ser Asn
20

<210> 630
<211> 20
<212> PRT
<213> Homo sapiens

<400> 630

Glu Lys Lys Ala Pro Thr Phe Leu Phe Met Leu Thr Ser Ser Gly Ile
1 5 10 15

Glu Lys Lys Ser
20

<210> 631
<211> 21
<212> PRT
<213> Homo sapiens

<400> 631

Glu Leu Gly Lys Gly Pro Gln Leu Ile Ile Asp Ile Arg Ser Asn Val
1 5 10 15

Gly Glu Lys Lys Asp
20

<210> 632
<211> 21
<212> PRT
<213> Homo sapiens

<400> 632

Glu Leu Gly Lys Arg Pro Gln Leu Ile Ile Asp Ile Arg Ser Asn Val
1 5 10 15

Gly Glu Lys Lys Asp
            20

<210> 633
<211> 21
<212> PRT
<213> Homo sapiens

<400> 633

Glu Pro Gly Ala Gly Leu Gln Leu Leu Thr Tyr Ile Phe Ser Asn Met
1   5   10   15

Asp Met Lys Gln Asp
            20

<210> 634
<211> 21
<212> PRT
<213> Homo sapiens

<400> 634

Glu Pro Gly Glu Gly Pro Val Leu Leu Val Thr Val Val Thr Gly Gly
1   5   10   15

Glu Val Lys Lys Leu
            20

<210> 635
<211> 21
<212> PRT
<213> Homo sapiens

<400> 635

Glu Ser Gly Lys Gly Pro Gln Phe Ile Ile Asp Ile Arg Ser Asn Met
1   5   10   15

Asp Lys Arg Gln Gly
            20

<210> 636
<211> 21
<212> PRT
<213> Homo sapiens

<400> 636

Glu Thr Ala Lys Thr Pro Glu Ala Leu Phe Val Met Thr Leu Asn Gly
1   5   10   15

Asp Glu Lys Lys Lys
            20

<210> 637
<211> 18
<212> PRT
<213> Homo sapiens

<400> 637

Phe Pro Gly Cys Ala Pro Arg Leu Leu Val Lys Gly Ser Lys Pro Ser
1 5 10 15

Gln Gln

<210> 638
<211> 21
<212> PRT
<213> Homo sapiens

<400> 638

Phe Pro Gly Lys Gly Pro Ala Leu Leu Ile Ala Ile Arg Pro Asp Val
1 5 10 15

Ser Glu Lys Lys Glu
20

<210> 639
<211> 22
<212> PRT
<213> Homo sapiens

<400> 639

Phe Pro Lys Lys Ser Leu Met Leu Met Ala Thr Ser Asn Glu Gly Ser
1 5 10 15

Lys Ala Thr Tyr Glu Gln
20

<210> 640
<211> 22
<212> PRT
<213> Homo sapiens

<400> 640

Phe Pro Lys Lys Ser Leu Met Gln Ile Ala Thr Ser Asn Glu Gly Ser
1 5 10 15

Lys Ala Thr Tyr Glu Gln
20

<210> 641

<211> 22
<212> PRT
<213> Homo sapiens

<400> 641

Phe Pro Lys Gln Ser Leu Met Leu Met Ala Thr Ser Asn Glu Gly Ser
1 5 10 15

Lys Ala Thr Tyr Glu Gln
20

<210> 642
<211> 19
<212> PRT
<213> Homo sapiens

<400> 642

Phe Pro Ser Gln Gly Pro Arg Phe Ile Ile Gln Gly Tyr Lys Thr Lys
1 5 10 15

Val Thr Asn

<210> 643
<211> 21
<212> PRT
<213> Homo sapiens

<400> 643

Gly Pro Gly Gln Asp Pro Gln Phe Leu Ile Ser Phe Tyr Glu Lys Met
1 5 10 15

Gln Ser Asp Lys Gly
20

<210> 644
<211> 20
<212> PRT
<213> Homo sapiens

<400> 644

His Ala Gly Glu Ala Pro Thr Phe Leu Ser Tyr Asn Val Leu Asp Gly
1 5 10 15

Leu Glu Glu Lys
20

<210> 645
<211> 20
<212> PRT
<213> Homo sapiens

<400> 645

His Asp Gly Gly Ala Pro Thr Phe Leu Ser Tyr Asn Gly Leu Asp Gly
1 5 10 15

Leu Glu Glu Thr
20

<210> 646
<211> 19
<212> PRT
<213> Homo sapiens

<400> 646

His Pro Ala Gly Ala Ile Val Ser Leu Phe Met Leu Ser Ser Gln Lys
1 5 10 15

Lys Lys His

<210> 647
<211> 22
<212> PRT
<213> Homo sapiens

<400> 647

His Pro Asn Lys Gly Leu Gln Leu Leu Leu Lys Tyr Thr Ser Ala Ala
1 5 10 15

Thr Leu Val Lys Gly Ile
20

<210> 648
<211> 19
<212> PRT
<213> Homo sapiens

<400> 648

Ile His Ser Gln Gly Pro Gln Tyr Ile Ile His Gly Leu Lys Asn Asn
1 5 10 15

Glu Thr Asn

<210> 649
<211> 21
<212> PRT
<213> Homo sapiens

<400> 649

Ile Leu Gly Gln Lys Val Glu Phe Leu Val Ser Phe Tyr Asn Asn Glu
1 5 10 15

Ile Ser Glu Lys Ser
20

<210> 650
<211> 21
<212> PRT
<213> Homo sapiens

<400> 650

Lys Ala Lys Lys Pro Pro Glu Leu Met Phe Val Tyr Ser Tyr Glu Lys
1 5 10 15

Leu Ser Ile Asn Glu
20

<210> 651
<211> 21
<212> PRT
<213> Homo sapiens

<400> 651

Lys His Gly Glu Ala Pro Val Phe Leu Met Ile Leu Leu Lys Gly Gly
1 5 10 15

Glu Gln Lys Gly His
20

<210> 652
<211> 21
<212> PRT
<213> Homo sapiens

<400> 652

Lys His Gly Glu Ala Pro Val Phe Leu Met Ile Leu Leu Lys Gly Gly
1 5 10 15

Glu Gln Met Arg Arg
20

<210> 653
<211> 21
<212> PRT
<213> Homo sapiens

<400> 653

Lys Leu Glu Glu Glu Leu Lys Phe Leu Val Tyr Phe Gln Asn Glu Glu
1 5 10 15

Leu Ile Gln Lys Ala
            20

<210> 654
<211> 21
<212> PRT
<213> Homo sapiens

<400> 654

Lys Ser Ser Gln Ala Pro Lys Leu Leu Phe His Tyr Tyr Asp Lys Asp
1   5   10   15

Phe Asn Asn Glu Ala
            20

<210> 655
<211> 21
<212> PRT
<213> Homo sapiens

<400> 655

Lys Ser Ser Gln Ala Pro Lys Leu Leu Phe His Tyr Tyr Asn Lys Asp
1   5   10   15

Phe Asn Asn Glu Ala
            20

<210> 656
<211> 21
<212> PRT
<213> Homo sapiens

<400> 656

Lys Tyr Gly Glu Gly Leu Ile Phe Leu Met Met Leu Gln Lys Gly Gly
1   5   10   15

Glu Glu Lys Ser His
            20

<210> 657
<211> 19
<212> PRT
<213> Homo sapiens

<400> 657

Leu Pro Ser Gln Gly Pro Glu Tyr Val Ile His Gly Leu Thr Ser Asn
1   5   10   15

Val Asn Asn

<210> 658
<211> 19
<212> PRT
<213> Homo sapiens

<400> 658

Asn Pro Trp Gly Gln Leu Ile Asn Leu Phe Tyr Ile Pro Ser Gly Thr
1 5 10 15

Lys Gln Asn

<210> 659
<211> 21
<212> PRT
<213> Homo sapiens

<400> 659

Asn Gln Asn Lys Glu Phe Met Leu Leu Ile Ser Phe Gln Asn Glu Gln
1 5 10 15

Val Leu Gln Glu Thr
20

<210> 660
<211> 21
<212> PRT
<213> Homo sapiens

<400> 660

Asn Ser Gly Arg Gly Leu Val His Leu Ile Leu Ile Arg Ser Asn Glu
1 5 10 15

Arg Glu Lys His Ser
20

<210> 661
<211> 22
<212> PRT
<213> Homo sapiens

<400> 661

Pro Pro Ser Gly Glu Leu Val Phe Leu Ile Arg Arg Asn Ser Phe Asp
1 5 10 15

Glu Gln Asn Glu Ile Ser
20

<210> 662

<211> 22
<212> PRT
<213> Homo sapiens

<400> 662

Pro Pro Ser Arg Gln Met Ile Leu Val Ile Arg Gln Glu Ala Tyr Lys
1 5 10 15

Gln Gln Asn Ala Thr Glu
20

<210> 663
<211> 22
<212> PRT
<213> Homo sapiens

<400> 663

Pro Ser Ser Gly Glu Met Ile Phe Leu Ile Tyr Gln Gly Ser Tyr Asp
1 5 10 15

Glu Gln Asn Ala Thr Glu
20

<210> 664
<211> 21
<212> PRT
<213> Homo sapiens

<400> 664

Arg Pro Gly Gly His Pro Val Phe Leu Ile Gln Leu Val Lys Ser Gly
1 5 10 15

Glu Val Lys Lys Gln
20

<210> 665
<211> 21
<212> PRT
<213> Homo sapiens

<400> 665

Ser Ala Lys Lys Pro Leu Glu Leu Met Phe Val Tyr Asn Phe Lys Glu
1 5 10 15

Gln Thr Glu Asn Asn
20

<210> 666
<211> 21
<212> PRT
<213> Homo sapiens

<400> 666

Ser Ala Lys Lys Pro Leu Glu Leu Met Phe Val Tyr Ser Leu Glu Glu
1 5 10 15

Arg Val Glu Asn Asn
20

<210> 667
<211> 21
<212> PRT
<213> Homo sapiens

<400> 667

Ser Leu Asp Gln Gly Leu Gln Phe Leu Ile His Tyr Tyr Asn Gly Glu
1 5 10 15

Glu Arg Ala Lys Gly
20

<210> 668
<211> 21
<212> PRT
<213> Homo sapiens

<400> 668

Ser Leu Asp Gln Gly Leu Gln Phe Leu Ile Gln Tyr Tyr Asn Gly Glu
1 5 10 15

Glu Arg Ala Lys Gly
20

<210> 669
<211> 21
<212> PRT
<213> Homo sapiens

<400> 669

Thr Leu Glu Glu Glu Leu Lys Phe Phe Ile Tyr Phe Gln Asn Glu Glu
1 5 10 15

Ile Ile Gln Lys Ala
20

<210> 670
<211> 21
<212> PRT
<213> Homo sapiens

<400> 670

```
Thr Leu Gly Gln Gly Leu Gln Phe Leu Phe Glu Tyr Phe Ser Glu Thr
1               5                   10                  15

Gln Arg Asn Lys Gly
            20
```

<210> 671
<211> 21
<212> PRT
<213> Homo sapiens

<400> 671

```
Thr Leu Gly Gln Gly Pro Glu Phe Leu Thr Tyr Phe Gln Asn Glu Ala
1               5                   10                  15

Gln Leu Glu Lys Ser
            20
```

<210> 672
<211> 16
<212> PRT
<213> Homo sapiens

<400> 672

```
Val Phe Leu Cys Leu Gln Tyr Arg Leu Arg Gly Lys Leu Arg Ala Glu
1               5                   10                  15
```

<210> 673
<211> 21
<212> PRT
<213> Homo sapiens

<400> 673

```
Val Leu Gly Gln Gly Pro Gln Phe Ile Phe Gln Tyr Tyr Glu Lys Glu
1               5                   10                  15

Glu Arg Gly Arg Gly
            20
```

<210> 674
<211> 21
<212> PRT
<213> Homo sapiens

<400> 674

```
Val Leu Lys Asn Glu Phe Lys Phe Leu Val Ser Phe Gln Asn Glu Asn
1               5                   10                  15

Val Phe Asp Glu Thr
            20
```

<210> 675
<211> 21
<212> PRT
<213> Homo sapiens

<400> 675

Val Met Gly Lys Glu Ile Lys Phe Leu Leu His Phe Val Lys Glu Ser
1 5 10 15

Lys Gln Asp Glu Ser
20

<210> 676
<211> 21
<212> PRT
<213> Homo sapiens

<400> 676

Tyr Pro Ala Glu Gly Pro Thr Phe Leu Ile Ser Ile Ser Ser Ile Lys
1 5 10 15

Asp Lys Asn Glu Asp
20

<210> 677
<211> 21
<212> PRT
<213> Homo sapiens

<400> 677

Tyr Pro Gly Glu Gly Leu Gln Leu Leu Leu Lys Ala Thr Lys Ala Asp
1 5 10 15

Asp Lys Gly Ser Asn
20

<210> 678
<211> 22
<212> PRT
<213> Homo sapiens

<400> 678

Tyr Pro Asn Gln Gly Leu Gln Leu Leu Leu Lys Tyr Leu Ser Gly Ser
1 5 10 15

Thr Leu Val Glu Ser Ile
20

<210> 679
<211> 22

<212> PRT
<213> Homo sapiens

<400> 679

Tyr Pro Asn Gln Gly Leu Gln Leu Leu Leu Lys Tyr Leu Ser Gly Ser
1 5 10 15

Thr Leu Val Lys Gly Ile
20

<210> 680
<211> 22
<212> PRT
<213> Homo sapiens

<400> 680

Tyr Pro Asn Gln Gly Leu Gln Leu Leu Leu Lys Tyr Thr Ser Ala Ala
1 5 10 15

Thr Leu Val Lys Gly Ile
20

<210> 681
<211> 22
<212> PRT
<213> Homo sapiens

<400> 681

Tyr Pro Asn Gln Gly Leu Gln Leu Leu Leu Lys Tyr Thr Ser Gly Ala
1 5 10 15

Thr Leu Val Lys Gly Ile
20

<210> 682
<211> 22
<212> PRT
<213> Homo sapiens

<400> 682

Tyr Pro Asn Gln Gly Leu Gln Leu Leu Leu Lys Tyr Thr Thr Gly Ala
1 5 10 15

Thr Leu Val Lys Gly Ile
20

<210> 683
<211> 22
<212> PRT
<213> Homo sapiens

<400> 683

Tyr Pro Asn Arg Gly Leu Gln Phe Leu Leu Lys Tyr Ile Thr Gly Asp
1 5 10 15

Asn Leu Val Lys Gly Ser
20

<210> 684
<211> 17
<212> PRT
<213> Homo sapiens

<400> 684

Tyr Pro Ser Lys Pro Leu Gln Leu Leu Gln Arg Glu Thr Met Glu Asn
1 5 10 15

Ser

<210> 685
<211> 20
<212> PRT
<213> Homo sapiens

<400> 685

Tyr Ser Gly Lys Ser Pro Glu Leu Ile Met Phe Ile Tyr Ser Asn Gly
1 5 10 15

Asp Lys Glu Asp
20

<210> 686
<211> 18
<212> PRT
<213> Homo sapiens

<400> 686

Tyr Ser Arg Gln Arg Leu Gln Leu Leu Leu Arg His Ile Ser Arg Glu
1 5 10 15

Ser Ile

<210> 687
<211> 8
<212> PRT
<213> Homo sapiens

<400> 687

Ala Asp Ala Arg Met Tyr Gly Val

1 5

<210> 688
<211> 20
<212> PRT
<213> Human herpesvirus

<400> 688

Asp Pro Gly Glu Gly Pro Ser Thr Gly Pro Arg Gly Gln Gly Asp Gly
1 5 10 15

Gly Arg Arg Lys
20

<210> 689
<211> 20
<212> PRT
<213> Human herpesvirus

<400> 689

Glu Ala Asp Tyr Phe Glu Tyr His Gln Glu Gly Gly Pro Asp Gly Glu
1 5 10 15

Pro Asp Val Pro
20

<210> 690
<211> 8
<212> PRT
<213> Homo sapiens

<400> 690

Glu Ala Leu Thr Gly Thr Glu Lys
1 5

<210> 691
<211> 20
<212> PRT
<213> Human herpesvirus

<400> 691

Gly Cys Lys Gly Thr His Gly Gly Thr Gly Ala Gly Ala Gly Ala Gly
1 5 10 15

Gly Ala Gly Ala
20

<210> 692
<211> 31
<212> PRT
<213> Human herpesvirus

<400> 692

Gly Glu Ala Asp Tyr Phe Glu Tyr His Gln Glu Gly Gly Pro Asp Gly
1 5 10 15

Glu Pro Asp Val Pro Pro Gly Ala Ile Glu Gln Gly Pro Ala Asp
20 25 30

<210> 693
<211> 20
<212> PRT
<213> Human herpesvirus

<400> 693

Gly Gly Pro Asp Gly Glu Pro Asp Val Pro Pro Gly Ala Ile Glu Gln
1 5 10 15

Gly Pro Ala Asp
20

<210> 694
<211> 29
<212> PRT
<213> Human herpesvirus

<400> 694

Gly Gly Pro Asp Gly Glu Pro Asp Val Pro Pro Gly Ala Ile Glu Gln
1 5 10 15

Gly Pro Ala Asp Asp Pro Gly Glu Gly Pro Ser Thr Gly
20 25

<210> 695
<211> 20
<212> PRT
<213> Human herpesvirus

<400> 695

Gly Gly Arg Pro Gly Ala Pro Gly Gly Ser Gly Ser Gly Pro Arg His
1 5 10 15

Arg Asp Gly Val
20

<210> 696
<211> 20
<212> PRT
<213> Human herpesvirus

<400> 696

```
Gly Asn Gly Leu Gly Glu Lys Gly Asp Thr Ser Gly Pro Glu Gly Ser
1               5                   10                  15

Gly Gly Ser Gly
            20


<210>  697
<211>  20
<212>  PRT
<213>  Human herpesvirus

<400>  697

Gly Arg Arg Pro Phe Phe His Pro Val Gly Glu Ala Asp Tyr Phe Glu
1               5                   10                  15

Tyr His Gln Glu
            20


<210>  698
<211>  20
<212>  PRT
<213>  Human herpesvirus

<400>  698

Gly Ser Gly Pro Arg His Arg Asp Gly Val Arg Arg Pro Gln Lys Arg
1               5                   10                  15

Pro Ser Cys Ile
            20


<210>  699
<211>  30
<212>  PRT
<213>  Human herpesvirus

<400>  699

Gly Ser Gly Pro Arg His Arg Asp Gly Val Arg Arg Pro Gln Lys Arg
1               5                   10                  15

Pro Ser Cys Ile Gly Cys Lys Gly Thr His Gly Gly Thr Gly
            20                  25                  30


<210>  700
<211>  9
<212>  PRT
<213>  Homo sapiens

<400>  700

His Ala Arg His Gly Phe Leu Pro Arg
1               5
```

<210> 701
<211> 9
<212> PRT
<213> Homo sapiens

<400> 701

Ile Ile Cys Tyr Asn Trp Leu His Arg
1 5

<210> 702
<211> 9
<212> PRT
<213> Homo sapiens

<400> 702

Lys Leu Arg Ala Glu Ile Glu Asn Leu
1 5

<210> 703
<211> 9
<212> PRT
<213> Homo sapiens

<400> 703

Lys Gln Arg Ile Lys Ser Gln Glu Arg
1 5

<210> 704
<211> 10
<212> PRT
<213> Homo sapiens

<400> 704

Lys Arg Pro Ser Gln Arg His Gly Ser Lys
1 5 10

<210> 705
<211> 10
<212> PRT
<213> Homo sapiens

<400> 705

Leu Leu Ala Val Leu Pro Val Leu Leu Leu
1 5 10

<210> 706
<211> 9
<212> PRT
<213> Homo sapiens

<400> 706

Leu Leu Glu Cys Cys Ala Arg Cys Leu
1 5

<210> 707
<211> 9
<212> PRT
<213> Homo sapiens

<400> 707

Leu Gln Tyr Arg Leu Arg Gly Lys Leu
1 5

<210> 708
<211> 8
<212> PRT
<213> Homo sapiens

<400> 708

Leu Arg Ile Arg Asn Val Arg Phe
1 5

<210> 709
<211> 9
<212> PRT
<213> Homo sapiens

<400> 709

Leu Arg Lys Phe Ser Ser Leu Cys Tyr
1 5

<210> 710
<211> 20
<212> PRT
<213> Human herpesvirus

<400> 710

Met Ser Asp Glu Gly Pro Gly Thr Gly Pro Gly Asn Gly Leu Gly Glu
1 5 10 15

Lys Gly Asp Thr
20

<210> 711
<211> 20
<212> PRT
<213> Human herpesvirus

<400> 711

Pro Gly Ala Ile Glu Gln Gly Pro Ala Asp Asp Pro Gly Glu Gly Pro
1 5 10 15

Ser Thr Gly Pro
20

<210> 712
<211> 7
<212> PRT
<213> Human herpesvirus

<400> 712

Pro Pro Pro Gly Arg Arg Pro
1 5

<210> 713
<211> 20
<212> PRT
<213> Human herpesvirus

<400> 713

Pro Gln Arg Arg Gly Gly Asp Asn His Gly Arg Gly Arg Gly Arg Gly
1 5 10 15

Arg Gly Arg Gly
20

<210> 714
<211> 20
<212> PRT
<213> Human herpesvirus

<400> 714

Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Gly Gly Arg Pro Gly Ala
1 5 10 15

Pro Gly Gly Ser
20

<210> 715
<211> 20
<212> PRT
<213> Human herpesvirus

<400> 715

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

Gly Gly Thr Gly
20

<210> 716
<211> 9
<212> PRT

<213> Homo sapiens

<400> 716

Arg Thr Glu Leu Leu Lys Asp Ala Ile
1 5

<210> 717
<211> 10
<212> PRT
<213> Homo sapiens

<400> 717

Arg Val Val His Leu Tyr Arg Asn Gly Lys
1 5 10

<210> 718
<211> 20
<212> PRT
<213> Human herpesvirus

<400> 718

Ser Gly Pro Glu Gly Ser Gly Gly Ser Gly Pro Gln Arg Arg Gly Gly
1 5 10 15

Asp Asn His Gly
20

<210> 719
<211> 20
<212> PRT
<213> Human herpesvirus

<400> 719

Ser Gly Ser Pro Pro Arg Arg Pro Pro Pro Gly Arg Arg Pro Phe Phe
1 5 10 15

His Pro Val Gly
20

<210> 720
<211> 9
<212> PRT
<213> Homo sapiens

<400> 720

Ser Leu Asp Val Met Ala Ser Gln Lys
1 5

<210> 721
<211> 36
<212> PRT

<213> Human herpesvirus

<400> 721

Ser Ser Gln Ser Ser Ser Ser Gly Ser Pro Pro Arg Arg Pro Pro Pro
1 5 10 15

Gly Arg Arg Pro Phe Phe His Pro Val Gly Glu Ala Asp Tyr Phe Glu
20 25 30

Tyr His Gln Glu
35

<210> 722
<211> 9
<212> PRT
<213> Homo sapiens

<400> 722

Thr Ala His Tyr Gly Ser Leu Pro Gln
1 5

<210> 723
<211> 20
<212> PRT
<213> Homo sapiens

<400> 723

Leu Ser Leu Ser Arg Phe Ser Trp Gly Ala Glu Gly Gln Arg Pro Gly
1 5 10 15

Phe Gly Tyr Gly
20

<210> 724
<211> 19
<212> PRT
<213> Homo sapiens

<400> 724

Ala Ala His Leu Pro Ala Glu Phe Thr Pro Ala Val His Ala Ser Leu
1 5 10 15

Asp Lys Phe

<210> 725
<211> 15
<212> PRT
<213> Homo sapiens

<400> 725

Ala Ala Val Gly Thr Ser Ala Ala Pro Val Pro Ser Asp Asn His
1 5 10 15

<210> 726
<211> 13
<212> PRT
<213> Homo sapiens

<400> 726

Ala Glu Pro Pro Pro Pro Pro Pro Glu Pro Ala Arg Ile
1 5 10

<210> 727
<211> 12
<212> PRT
<213> Homo sapiens

<400> 727

Ala Gly Glu Tyr Asp His Leu Pro Glu Gln Ala Phe
1 5 10

<210> 728
<211> 11
<212> PRT
<213> Homo sapiens

<400> 728

Ala Leu Met Glu Gly Gly Glu Asn Gly Pro Trp
1 5 10

<210> 729
<211> 11
<212> PRT
<213> Homo sapiens

<400> 729

Ala Leu Met Leu Ala Ile Ser His Gly Arg Gln
1 5 10

<210> 730
<211> 9
<212> PRT
<213> Homo sapiens

<400> 730

Ala Leu Tyr Ser Gly Val His Lys Lys
1 5

<210> 731
<211> 15
<212> PRT

<213> Homo sapiens

<400> 731

Ala Gln Val Ile Ile Leu Asn His Pro Gly Gln Ile Ser Ala Gly
1 5 10 15

<210> 732
<211> 12
<212> PRT
<213> Homo sapiens

<400> 732

Ala Arg Lys Leu Ile Gly Asp Pro Asn Leu Glu Phe
1 5 10

<210> 733
<211> 10
<212> PRT
<213> Homo sapiens

<400> 733

Ala Ser Ser Ser Val Leu Ser Ser Pro Ala
1 5 10

<210> 734
<211> 13
<212> PRT
<213> Homo sapiens

<400> 734

Ala Ser Val Asp Leu Lys Asn Thr Gly Arg Glu Glu Phe
1 5 10

<210> 735
<211> 14
<212> PRT
<213> Homo sapiens

<400> 735

Ala Ser Val Asp Leu Lys Asn Thr Gly Arg Glu Glu Phe Leu
1 5 10

<210> 736
<211> 16
<212> PRT
<213> Homo sapiens

<400> 736

Ala Ser Val Asp Leu Lys Asn Thr Gly Arg Glu Glu Phe Leu Thr Ala
1 5 10 15

<210> 737
<211> 10
<212> PRT
<213> Homo sapiens

<400> 737

Ala Thr Ala Leu Pro Thr Gly Thr Ser Lys
1 5 10

<210> 738
<211> 9
<212> PRT
<213> Homo sapiens

<400> 738

Ala Thr Ala Asn Gln Ile Ile Leu Lys
1 5

<210> 739
<211> 9
<212> PRT
<213> Homo sapiens

<400> 739

Ala Thr Ile Ile Asp Ile Leu Thr Lys
1 5

<210> 740
<211> 9
<212> PRT
<213> Homo sapiens

<400> 740

Ala Thr Val Ala Gly Val His Val Lys
1 5

<210> 741
<211> 12
<212> PRT
<213> Homo sapiens

<400> 741

Ala Thr Val Arg Gln Lys Leu Gln Asp Glu Thr Asn
1 5 10

<210> 742
<211> 9
<212> PRT
<213> Homo sapiens

<400> 742

Ala Thr Val Thr Pro Ser Pro Val Lys

1 5

<210> 743
<211> 9
<212> PRT
<213> Homo sapiens

<400> 743

Ala Val Ala Leu Pro Leu Gln Thr Lys
1 5

<210> 744
<211> 12
<212> PRT
<213> Homo sapiens

<400> 744

Ala Val Ile Leu Pro Pro Leu Ser Pro Tyr Phe Lys
1 5 10

<210> 745
<211> 9
<212> PRT
<213> Homo sapiens

<400> 745

Ala Val Gln Arg Thr Leu Leu Glu Lys
1 5

<210> 746
<211> 9
<212> PRT
<213> Homo sapiens

<400> 746

Ala Val Thr Asp Val Ile Ile Ala Lys
1 5

<210> 747
<211> 17
<212> PRT
<213> Homo sapiens

<400> 747

Ala Val Val Asp Lys Ala Ala Glu Ala Gly Gly Ala Glu Glu Gln Tyr
1 5 10 15

Gly

<210> 748

<211> 9
<212> PRT
<213> Homo sapiens

<400> 748

Ala Val Tyr Ser His Val Ile Gln Lys
1 5

<210> 749
<211> 12
<212> PRT
<213> Homo sapiens

<400> 749

Ala Trp Lys Arg Ala Glu Ala Ile Glu Ser Ser Leu
1 5 10

<210> 750
<211> 10
<212> PRT
<213> Homo sapiens

<400> 750

Cys Pro Leu Ser Leu Ala Ala Gln Leu Asp
1 5 10

<210> 751
<211> 10
<212> PRT
<213> Homo sapiens

<400> 751

Asp Glu Ser Gly Pro Ser Ile Val His Arg
1 5 10

<210> 752
<211> 13
<212> PRT
<213> Homo sapiens

<400> 752

Asp Glu Trp Val Lys Pro Lys Asp Met Leu Gly Pro Lys
1 5 10

<210> 753
<211> 18
<212> PRT
<213> Homo sapiens

<400> 753

Asp Phe Ala Ile Val Lys Phe Thr Lys Val Leu Leu Gln Tyr Thr Gly
1 5 10 15

His Ile

<210> 754
<211> 14
<212> PRT
<213> Homo sapiens

<400> 754

Asp Gly Val Ile Lys Val Phe Asn Asp Met Lys Val Arg Lys
1 5 10

<210> 755
<211> 13
<212> PRT
<213> Homo sapiens

<400> 755

Asp Leu Pro Ser Glu Ala Ser Ala Ser Thr Ala Gly Pro
1 5 10

<210> 756
<211> 10
<212> PRT
<213> Homo sapiens

<400> 756

Asp Leu Pro Trp Phe Arg Thr Leu Ser Trp
1 5 10

<210> 757
<211> 13
<212> PRT
<213> Homo sapiens

<400> 757

Asp Leu Ser Gln Val Ala Ala Ile Ser Asn Asp Leu Lys
1 5 10

<210> 758
<211> 14
<212> PRT
<213> Homo sapiens

<400> 758

Asp Pro Pro Leu Ile Ala Leu Asp Lys Asp Ala Pro Leu Arg
1 5 10

<210> 759
<211> 9

<212> PRT
<213> Homo sapiens

<400> 759

Asp Thr Asp His Tyr Phe Leu Arg Tyr
1 5

<210> 760
<211> 11
<212> PRT
<213> Homo sapiens

<400> 760

Asp Thr Gly Ile Leu Asp Ser Ile Gly Arg Phe
1 5 10

<210> 761
<211> 14
<212> PRT
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Arg

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Asp Pro Leu Asn Pro Thr Ser Gln Leu
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Gly Pro Ala Arg Val Pro Val Pro Phe
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Gly Pro Cys Phe Leu Trp Leu Lys Leu
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1 5 10

<210> 1036
<211> 11
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1036

Val Val His Phe Phe Lys Asn Val Val Ile Lys
1 5 10

<210> 1037
<211> 11
<212> PRT
<213> Unknown

<220>

<223> epitope involved in multiple sclerosis

<400> 1037

Val Val His Phe Phe Lys Asn Val Val Ile Pro
1   5   10

<210> 1038
<211> 11
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1038

Val Val His Phe Phe Lys Asn Val Val Thr Pro
1   5   10

<210> 1039
<211> 3
<212> PRT
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<220>
<223> epitope involved in multiple sclerosis

<400> 1039

Val Val Ile
1

<210> 1040
<211> 11
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1040

Val Val Ile Phe Phe Lys Asn Val Val Ile Lys
1   5   10

<210> 1041
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1041

Glu Arg Pro Asn His Thr Val
1   5

<210> 1042
<211> 5
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1042

Arg Pro Asn His Thr
1 5

<210> 1043
<211> 21
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1043

Thr Pro Arg Val Glu Arg Gly Asn His Thr Val Phe Leu Ala Pro Tyr
1 5 10 15

Gly Trp Met Val Lys
20

<210> 1044
<211> 21
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1044

Thr Pro Arg Val Glu Arg Asn Gly His Ser Val Phe Leu Ala Pro Tyr
1 5 10 15

Gly Trp Met Val Lys
20

<210> 1045
<211> 21
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1045

Thr Pro Arg Val Glu Arg Pro Asn His Thr Val Phe Leu Ala Pro Tyr
1 5 10 15

Gly Trp Met Val Lys
20

<210> 1046
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1046

Ala Asp Asp Leu Lys Lys Leu Lys Pro Gly Leu Glu Lys Asp Phe Leu
1 5 10 15

Pro Leu Tyr

<210> 1047
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1047

Ala Val Gln Thr Gly Leu Asp Leu Leu Glu Ile Leu Arg Gln Glu Lys
1 5 10 15

Gly Gly Ser

<210> 1048
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1048

Asp Asn Leu Pro Arg Gly Ser Arg Ala His Ile Thr Leu Gly Cys Ala
1 5 10 15

Ala Asp Val

<210> 1049
<211> 21
<212> PRT
<213> Homo sapiens

<400> 1049

Asp Gln Tyr Gln Tyr Gln Val Val Leu Val Glu Pro Lys Thr Ala Trp
1 5 10 15

Arg Leu Asp Cys Ala

20

<210> 1050
<211> 18
<212> PRT
<213> Homo sapiens

<400> 1050

Asp Thr Val Ala Thr Leu Leu Glu Cys Lys Thr Leu Phe Ile Leu Arg
1 5 10 15

Gly Leu

<210> 1051
<211> 34
<212> PRT
<213> Homo sapiens

<400> 1051

Asp Val Leu Lys Lys Ser Tyr Ser Lys Ala Phe Thr Leu Thr Ile Ser
1 5 10 15

Ala Leu Phe Val Thr Pro Lys Thr Thr Gly Ala Arg Val Glu Leu Ser
20 25 30

Glu Gln

<210> 1052
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1052

Glu Glu Leu Gly Asn His Lys Ala Phe Lys Lys Glu Leu Arg Gln Phe
1 5 10 15

Val Pro Gly

<210> 1053
<211> 18
<212> PRT
<213> Homo sapiens

<400> 1053

Glu Leu Gln Phe Pro Phe Leu Gln Asp Glu Asp Thr Val Ala Thr Leu
1 5 10 15

Leu Glu

<210> 1054
<211> 18
<212> PRT
<213> Homo sapiens

<400> 1054

Glu Leu Ser Glu Gln Gln Leu Gln Leu Trp Pro Ser Asp Val Asp Lys
1 5 10 15

Leu Ser

<210> 1055
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1055

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

Pro Gly Val

<210> 1056
<211> 39
<212> PRT
<213> Homo sapiens

<400> 1056

Phe Pro Phe Leu Gln Asp Glu Asp Thr Val Ala Thr Leu Leu Glu Cys
1 5 10 15

Lys Thr Leu Phe Ile Leu Arg Gly Leu Pro Gly Ser Gly Lys Ser Thr
20 25 30

Leu Ala Arg Val Ile Val Asp
35

<210> 1057
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1057

Gly Ala Arg Gly Ala Phe Ser Glu Glu Tyr Lys Arg Leu Asp Glu Asp
1 5 10 15

Leu Ala Ala

<210> 1058
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1058

Gly Glu Glu Val Gly Glu Leu Ser Arg Gly Lys Leu Tyr Ser Leu Gly
1 5 10 15

Asn Gly Arg

<210> 1059
<211> 21
<212> PRT
<213> Homo sapiens

<400> 1059

Gly Lys Pro Val Pro Thr Gln Gly Ser Arg Lys Gly Gly Ala Leu Gln
1 5 10 15

Ser Cys Thr Ile Ile
20

<210> 1060
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1060

Gly Trp Phe Leu Thr Lys Lys Ser Ser Glu Thr Leu Arg Lys Ala Gly
1 5 10 15

Gln Val Phe

<210> 1061
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1061

His Cys Thr Thr Lys Phe Cys Asp Tyr Gly Lys Ala Pro Gly Ala Glu
1 5 10 15

Glu Tyr Ala

<210> 1062
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1062

Ile Leu Arg Gln Glu Lys Gly Gly Ser Arg Gly Glu Glu Val Gly Glu
1 5 10 15

Leu Ser Arg

<210> 1063
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1063

Ile Thr Leu Gly Cys Ala Ala Asp Val Glu Ala Val Gln Thr Gly Leu
1 5 10 15

Asp Leu Leu

<210> 1064
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1064

Lys Ala Phe Thr Leu Thr Ile Ser Ala Leu Phe Val Thr Pro Lys Thr
1 5 10 15

Thr Gly Ala Arg
20

<210> 1065
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1065

Lys Ala Pro Gly Ala Glu Glu Tyr Ala Gln Gln Asp Val Leu Lys Lys
1 5 10 15

Ser Tyr Ser

<210> 1066

<211> 19
<212> PRT
<213> Mus musculus

<400> 1066

Lys Glu Lys Arg Gln Phe Val Pro Gly Asp Glu Pro Arg Glu Lys Met
1 5 10 15

Asp Leu Val

<210> 1067
<211> 32
<212> PRT
<213> Homo sapiens

<400> 1067

Lys Lys Leu Lys Pro Gly Leu Glu Lys Asp Phe Leu Pro Leu Tyr Phe
1 5 10 15

Gly Trp Phe Leu Thr Lys Lys Ser Ser Glu Thr Leu Arg Lys Ala Gly
20 25 30

<210> 1068
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1068

Lys Leu Tyr Ser Leu Gly Asn Gly Arg Trp Met Leu Thr Leu Ala Lys
1 5 10 15

Asn Met Glu

<210> 1069
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1069

Lys Arg Leu Asp Glu Asp Leu Ala Ala Tyr Cys Arg Arg Arg Asp Ile
1 5 10 15

Arg Ile Leu

<210> 1070
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1070

Lys Thr Ala Trp Arg Leu Asp Cys Ala Gln Leu Lys Glu Lys Asn Gln
1 5 10 15

Trp Gln Leu

<210> 1071
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1071

Leu Asp Asp Thr Asn His Glu Arg Glu Arg Leu Glu Gln Leu Phe Glu
1 5 10 15

Met Ala Asp

<210> 1072
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1072

Leu Glu Lys Asp Phe Leu Pro Leu Tyr Phe Gly Trp Phe Leu Thr Lys
1 5 10 15

Lys Ser Ser

<210> 1073
<211> 18
<212> PRT
<213> Mus musculus

<400> 1073

Leu Glu Gln Leu Phe Glu Met Ala Asp Gln Tyr Gln Gln Val Val Leu
1 5 10 15

Val Glu

<210> 1074
<211> 18
<212> PRT
<213> Homo sapiens

<400> 1074

Leu Lys Glu Lys Asn Gln Trp Gln Leu Ser Ala Asp Asp Leu Lys Lys
1 5 10 15

Leu Lys

<210> 1075
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1075

Met Leu Thr Leu Ala Lys Asn Met Glu Val Arg Ala Ile Phe Thr Gly
1 5 10 15

Tyr Tyr Gly

<210> 1076
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1076

Met Ser Ser Ser Gly Ala Lys Asp Lys Pro Glu Leu Gln Phe Pro Phe
1 5 10 15

Leu Gln Asp

<210> 1077
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1077

Pro Ser Asp Val Asp Lys Leu Ser Pro Thr Asp Asn Leu Pro Arg Gly
1 5 10 15

Ser Arg Ala

<210> 1078
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1078

Gln Asp Val Leu Lys Lys Ser Tyr Ser Lys Ala Phe Thr Leu Thr Ile
1 5 10 15

Ser Ala Leu

<210> 1079
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1079

Arg Ala Ile Phe Thr Gly Tyr Tyr Gly Lys Gly Lys Pro Val Pro Thr
1 5 10 15

Gln Gly Ser

<210> 1080
<211> 18
<212> PRT
<213> Homo sapiens

<400> 1080

Arg Arg Arg Asp Ile Arg Ile Leu Val Leu Asp Asp Thr Asn His Glu
1 5 10 15

Arg Glu

<210> 1081
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1081

Ser Gly Lys Ser Thr Leu Ala Arg Val Ile Val Asp Lys Tyr Arg Asp
1 5 10 15

Gly Thr Lys

<210> 1082
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1082

Thr Leu Phe Ile Leu Arg Gly Leu Pro Gly Ser Gly Lys Ser Thr Leu
1 5 10 15

Ala Arg Val

<210> 1083
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1083

Thr Leu Arg Lys Ala Gly Gln Val Phe Leu Glu Glu Leu Gly Asn His
1 5 10 15

Lys Ala Phe

<210> 1084
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1084

Val Asp Lys Tyr Arg Asp Gly Thr Lys Met Val Ser Ala Asp Ala Tyr
1 5 10 15

Lys Ile Thr

<210> 1085
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1085

Val Ser Ala Asp Ala Tyr Lys Ile Thr Pro Gly Ala Arg Gly Ala Phe
1 5 10 15

Ser Glu Glu

<210> 1086
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1086

Val Thr Pro Lys Thr Thr Gly Ala Arg Val Glu Leu Ser Glu Gln Gln
1 5 10 15

Leu Gln Leu

<210> 1087

<211> 19
<212> PRT
<213> Homo sapiens

<400> 1087

Tyr Phe Gly Lys Arg Pro Pro Gly Val Leu His Cys Thr Thr Lys Phe
1 5 10 15

Cys Asp Tyr

<210> 1088
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1088

Ala Ala Met Glu Leu Lys Val Glu Asp Pro Phe Tyr Trp Val Ser Pro
1 5 10 15

<210> 1089
<211> 9
<212> PRT
<213> Homo sapiens

<400> 1089

Cys Leu Gln Tyr Arg Leu Arg Gly Lys
1 5

<210> 1090
<211> 16
<212> PRT
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<400> 1090

Cys Trp Lys Ile Thr Leu Phe Val Ile Val Pro Val Leu Gly Pro Leu
1 5 10 15

<210> 1091
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1091

Asp Pro Phe Tyr Trp Val Ser Pro Gly Val Leu Val Leu Leu Ala Val
1 5 10 15

<210> 1092
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1092

Asp Pro His Phe Leu Arg Val Pro Cys Trp Lys Ile Thr Leu Phe Val
1 5 10 15

<210> 1093
<211> 16
<212> PRT
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<400> 1093

Glu Gly Gly Phe Thr Cys Phe Phe Arg Asp His Ser Tyr Gln Glu Glu
1 5 10 15

<210> 1094
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1094

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

<210> 1095
<211> 17
<212> PRT
<213> Homo sapiens

<400> 1095

Glu Asn Pro Val Val His Phe Phe Lys Asn Ile Val Thr Pro Arg Thr
1 5 10 15

Pro

<210> 1096
<211> 9
<212> PRT
<213> Homo sapiens

<400> 1096

Phe Leu Cys Leu Gln Tyr Arg Leu Arg
1 5

<210> 1097
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1097

Gly Asp Glu Val Glu Leu Pro Cys Arg Ile Ser Pro Gly Lys Asn Ala
1 5 10 15

<210> 1098
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1098

Gly Glu Gly Lys Val Thr Leu Arg Ile Arg Asn Val Arg Phe Ser Asp
1 5 10 15

<210> 1099
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1099

Gly Lys Asn Ala Thr Gly Met Glu Val Gly Trp Tyr Arg Pro Pro Phe
1 5 10 15

<210> 1100
<211> 9
<212> PRT
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<400> 1100

Gly Leu Val Phe Leu Cys Leu Gln Tyr
1 5

<210> 1101
<211> 16
<212> PRT
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<400> 1101

Gly Gln Phe Arg Val Ile Gly Pro Arg His Pro Ile Arg Ala Leu Val
1 5 10 15

<210> 1102
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1102

Gly Val Leu Val Leu Leu Ala Val Leu Pro Val Leu Leu Leu Gln Ile
1 5 10 15

<210> 1103
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1103

His Leu Tyr Arg Asn Gly Lys Asp Gln Asp Gly Asp Gln Ala Pro Glu
1 5 10 15

<210> 1104
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1104

His Arg Thr Phe Asp Pro His Phe Leu Arg Val Pro Cys Trp Lys Ile
1 5 10 15

<210> 1105
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1105

Ile Cys Tyr Asn Trp Leu His Arg Arg Leu Ala Gly Gln Phe Leu Glu
1 5 10 15

<210> 1106
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1106

Ile Glu Asn Leu His Arg Thr Phe Asp Pro His Phe Leu Arg Val Pro
1 5 10 15

<210> 1107
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1107

Ile Arg Asn Val Arg Phe Ser Asp Glu Gly Gly Phe Thr Cys Phe Phe
1 5 10 15

<210> 1108
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1108

Ile Val Pro Val Leu Gly Pro Leu Val Ala Leu Ile Ile Cys Tyr Asn
1 5 10 15

<210> 1109
<211> 16
<212> PRT

<213> Homo sapiens

<400> 1109

Lys Asp Ala Ile Gly Glu Gly Lys Val Thr Leu Arg Ile Arg Asn Val
1 5 10 15

<210> 1110
<211> 21
<212> PRT
<213> Homo sapiens

<400> 1110

Lys Asn Ala Thr Gly Met Glu Val Gly Trp Tyr Arg Pro Pro Phe Ser
1 5 10 15

Arg Val Val His Leu
20

<210> 1111
<211> 21
<212> PRT
<213> Homo sapiens

<400> 1111

Lys Asn Ala Thr Gly Met Glu Val Gly Trp Tyr Arg Pro Pro Phe Ser
1 5 10 15

Arg Val Val His Leu
20

<210> 1112
<211> 9
<212> PRT
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<400> 1112

Leu Cys Leu Gln Tyr Arg Leu Arg Gly
1 5

<210> 1113
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1113

Leu Gly Pro Leu Val Ala Leu Ile Ile Cys Tyr Asn Trp Leu His Arg
1 5 10 15

<210> 1114
<211> 16
<212> PRT

<213> Homo sapiens

<400> 1114

Leu Lys Val Glu Asp Pro Phe Tyr Trp Val Ser Pro Gly Val Leu Val
1 5 10 15

<210> 1115
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1115

Leu Leu Ala Val Leu Pro Val Leu Leu Leu Gln Ile Thr Val Gly Leu
1 5 10 15

<210> 1116
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1116

Leu Leu Gln Ile Thr Val Gly Leu Val Phe Leu Cys Leu Gln Tyr Arg
1 5 10 15

<210> 1117
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1117

Leu Pro Val Leu Leu Leu Gln Ile Thr Val Gly Leu Val Phe Leu Cys
1 5 10 15

<210> 1118
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1118

Leu Gln Tyr Arg Leu Arg Gly Lys Leu Arg Ala Glu Ile Glu Asn Leu
1 5 10 15

<210> 1119
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1119

Leu Arg Ala Glu Ile Glu Asn Leu His Arg Thr Phe Asp Pro His Phe
1 5 10 15

<210> 1120
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1120

Leu Arg Gly Lys Leu Arg Ala Glu Ile Glu Asn Leu His Arg Thr Phe
1 5 10 15

<210> 1121
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1121

Leu Arg Val Pro Cys Trp Lys Ile Thr Leu Phe Val Ile Val Pro Val
1 5 10 15

<210> 1122
<211> 9
<212> PRT
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<400> 1122

Leu Val Phe Leu Cys Leu Gln Tyr Arg
1 5

<210> 1123
<211> 16
<212> PRT
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<400> 1123

Asn Gly Lys Asp Gln Asp Gly Asp Gln Ala Pro Glu Tyr Arg Gly Arg
1 5 10 15

<210> 1124
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1124

Gln Ala Pro Glu Tyr Arg Gly Arg Thr Glu Leu Leu Lys Asp Ala Ile
1 5 10 15

<210> 1125
<211> 16
<212> PRT
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<400> 1125

Gln Asp Gly Asp Gln Ala Pro Glu Tyr Arg Gly Arg Thr Glu Leu Leu

1 5 10 15

<210> 1126
<211> 9
<212> PRT
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<400> 1126

Gln Tyr Arg Leu Arg Gly Lys Leu Arg
1 5

<210> 1127
<211> 16
<212> PRT
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<400> 1127

Arg Ala Leu Val Gly Asp Glu Val Glu Leu Pro Cys Arg Ile Ser Pro
1 5 10 15

<210> 1128
<211> 16
<212> PRT
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<400> 1128

Arg Asp His Ser Tyr Gln Glu Glu Ala Ala Met Glu Leu Lys Val Glu
1 5 10 15

<210> 1129
<211> 16
<212> PRT
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<400> 1129

Arg Phe Ser Asp Glu Gly Gly Phe Thr Cys Phe Phe Arg Asp His Ser
1 5 10 15

<210> 1130
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1130

Arg His Pro Ile Arg Ala Leu Val Gly Asp Glu Val Glu Leu Pro Cys
1 5 10 15

<210> 1131
<211> 16
<212> PRT
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<400> 1131

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

<210> 1132
<211> 14
<212> PRT
<213> Homo sapiens

<400> 1132

Arg Leu Ala Gly Gln Phe Leu Glu Glu Leu Arg Asn Pro Phe
1 5 10

<210> 1133
<211> 9
<212> PRT
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<400> 1133

Arg Leu Arg Gly Lys Leu Arg Ala Glu
1 5

<210> 1134
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1134

Arg Pro Pro Phe Ser Arg Val Val His Leu Tyr Arg Asn Gly Lys Asp
1 5 10 15

<210> 1135
<211> 16
<212> PRT
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<400> 1135

Ser Arg Val Val His Leu Tyr Arg Asn Gly Lys Asp Gln Asp Gly Asp
1 5 10 15

<210> 1136
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1136

Thr Cys Phe Phe Arg Asp His Ser Tyr Gln Glu Glu Ala Ala Met Glu
1 5 10 15

<210> 1137
<211> 16

<212> PRT
<213> Homo sapiens

<400> 1137

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

<210> 1138
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1138

Thr Gly Met Glu Val Gly Trp Tyr Arg Pro Pro Phe Ser Arg Val Val
1 5 10 15

<210> 1139
<211> 16
<212> PRT
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<400> 1139

Thr Leu Phe Val Ile Val Pro Val Leu Gly Pro Leu Val Ala Leu Ile
1 5 10 15

<210> 1140
<211> 21
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1140

Thr Pro Arg Val Glu Arg Asn Gly His Ser Val Phe Leu Ala Pro Tyr
1 5 10 15

Gly Trp Met Val Lys
20

<210> 1141
<211> 21
<212> PRT
<213> Unknown

<220>
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<400> 1141

Thr Pro Arg Val Glu Arg Asn Gly His Ser Val Phe Leu Ala Pro Tyr
1 5 10 15

Gly Trp Met Val Lys
20

<210> 1142
<211> 16
<212> PRT
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<400> 1142

Thr Val Gly Leu Val Phe Leu Cys Leu Gln Tyr Arg Leu Arg Gly Lys
1 5 10 15

<210> 1143
<211> 16
<212> PRT
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<400> 1143

Val Ala Leu Ile Ile Cys Tyr Asn Trp Leu His Arg Arg Leu Ala Gly
1 5 10 15

<210> 1144
<211> 9
<212> PRT
<213> Homo sapiens

<400> 1144

Val Phe Leu Cys Leu Gln Tyr Arg Leu
1 5

<210> 1145
<211> 9
<212> PRT
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<400> 1145

Val Gly Leu Val Phe Leu Cys Leu Gln
1 5

<210> 1146
<211> 16
<212> PRT
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<400> 1146

Val Gly Trp Tyr Arg Pro Pro Phe Ser Arg Val Val His Leu Tyr Arg
1 5 10 15

<210> 1147
<211> 16
<212> PRT
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<400> 1147

Val Ile Gly Pro Arg His Pro Ile Arg Ala Leu Val Gly Asp Glu Val
1 5 10 15

<210> 1148
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1148

Val Thr Leu Arg Ile Arg Asn Val Arg Phe Ser Asp Glu Gly Gly Phe
1 5 10 15

<210> 1149
<211> 16
<212> PRT
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<400> 1149

Trp Leu His Arg Arg Leu Ala Gly Gln Phe Leu Glu Glu Leu Arg Asn
1 5 10 15

<210> 1150
<211> 16
<212> PRT
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<400> 1150

Trp Val Ser Pro Gly Val Leu Val Leu Leu Ala Val Leu Pro Val Leu
1 5 10 15

<210> 1151
<211> 16
<212> PRT
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<400> 1151

Tyr Gln Glu Glu Ala Ala Met Glu Leu Lys Val Glu Asp Pro Phe Tyr
1 5 10 15

<210> 1152
<211> 16
<212> PRT
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<400> 1152

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

<210> 1153

<211> 9
<212> PRT
<213> Homo sapiens

<400> 1153

Tyr Arg Leu Arg Gly Lys Leu Arg Ala
1 5

<210> 1154
<211> 21
<212> PRT
<213> Human herpesvirus

<400> 1154

Ala Gly Ala Gly Gly Gly Ala Gly Gly Ala Gly Ala Gly Gly Gly Ala
1 5 10 15

Gly Gly Ala Gly Gly
20

<210> 1155
<211> 28
<212> PRT
<213> Human herpesvirus

<400> 1155

Asp Gly Glu Pro Asp Val Pro Pro Gly Ala Ile Glu Gln Gly Pro Ala
1 5 10 15

Asp Asp Pro Gly Glu Gly Pro Ser Thr Gly Pro Arg
20 25

<210> 1156
<211> 22
<212> PRT
<213> Human herpesvirus

<400> 1156

Gly Gly Ser Gly Gly Arg Arg Gly Arg Gly Arg Glu Arg Ala Arg Gly
1 5 10 15

Gly Ser Arg Glu Arg Ala
20

<210> 1157
<211> 26
<212> PRT
<213> Human herpesvirus

<400> 1157

Gly Val Phe Val Tyr Gly Gly Ser Lys Thr Ser Leu Tyr Asn Leu Arg

1 5 10 15

Arg Gly Thr Ala Leu Ala Ile Pro Gln Cys
20 25

<210> 1158
<211> 26
<212> PRT
<213> Human herpesvirus

<400> 1158

Lys Phe Glu Asn Ile Ala Glu Gly Leu Arg Ala Leu Leu Ala Arg Ser
1 5 10 15

His Val Glu Arg Thr Thr Asp Glu Gly Thr
20 25

<210> 1159
<211> 27
<212> PRT
<213> Human herpesvirus

<400> 1159

Lys Lys Gly Gly Trp Phe Gly Lys His Arg Gly Gln Gly Gly Ser Asn
1 5 10 15

Pro Lys Phe Glu Asn Ile Ala Glu Gly Leu Arg
20 25

<210> 1160
<211> 44
<212> PRT
<213> Human herpesvirus

<400> 1160

Met Ser Asp Glu Gly Pro Gly Thr Gly Pro Gly Asn Gly Leu Gly Glu
1 5 10 15

Lys Gly Asp Thr Ser Gly Pro Glu Gly Ser Gly Gly Ser Gly Pro Gln
20 25 30

Arg Arg Gly Gly Asp Asn His Gly Arg Gly Arg Gly
35 40

<210> 1161
<211> 27
<212> PRT
<213> Human herpesvirus

<400> 1161

Pro Pro Arg Arg Pro Pro Pro Gly Arg Arg Pro Phe Phe His Pro Val
1 5 10 15

Gly Glu Ala Asp Tyr Phe Glu Tyr His Gln Glu
20 25

<210> 1162
<211> 28
<212> PRT
<213> Human herpesvirus

<400> 1162

Pro Arg Gly Gln Gly Asp Gly Gly Arg Arg Lys Lys Gly Gly Trp Phe
1 5 10 15

Gly Lys His Arg Gly Gln Gly Gly Ser Asn Pro Lys
20 25

<210> 1163
<211> 26
<212> PRT
<213> Human herpesvirus

<400> 1163

Gln Gly Pro Ala Asp Asp Pro Gly Glu Gly Pro Ser Thr Gly Pro Arg
1 5 10 15

Gly Gln Gly Asp Gly Gly Arg Arg Lys Lys
20 25

<210> 1164
<211> 20
<212> PRT
<213> Human herpesvirus

<400> 1164

Arg Glu Arg Ala Arg Gly Gly Ser Arg Glu Arg Ala Arg Gly Arg Gly
1 5 10 15

Arg Gly Arg Gly
20

<210> 1165
<211> 149
<212> PRT
<213> Human herpesvirus

<400> 1165

Arg Lys Lys Gly Gly Trp Phe Gly Lys His Arg Gly Gln Gly Gly Ser
1 5 10 15

Asn Pro Lys Phe Glu Asn Ile Ala Glu Gly Leu Arg Ala Leu Leu Ala
20 25 30

Arg Ser His Val Glu Arg Thr Thr Asp Glu Gly Thr Trp Val Ala Gly
35 40 45

Val Phe Val Tyr Gly Gly Ser Lys Thr Ser Leu Tyr Asn Leu Arg Arg
50 55 60

Gly Thr Ala Leu Ala Ile Pro Gln Cys Arg Leu Thr Pro Leu Ser Arg
65 70 75 80

Leu Pro Phe Gly Met Ala Pro Gly Pro Gly Pro Gln Pro Gly Pro Leu
85 90 95

Arg Glu Ser Ile Val Cys Tyr Phe Met Val Phe Leu Gln Thr His Ile
100 105 110

Phe Ala Glu Val Leu Lys Asp Ala Ile Lys Asp Leu Val Met Thr Lys
115 120 125

Pro Ala Pro Thr Cys Asn Ile Arg Val Thr Val Cys Ser Phe Asp Asp
130 135 140

Gly Val Asp Leu Pro
145

<210> 1166
<211> 28
<212> PRT
<213> Human herpesvirus

<400> 1166

Val Glu Gly Ala Ala Ala Glu Gly Asp Asp Gly Asp Asp Gly Asp Glu
1 5 10 15

Gly Gly Asp Gly Asp Glu Gly Glu Glu Gly Gln Glu
20 25

<210> 1167
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1167

Ala Val Ile Met Gly Asn Trp Glu Asn His Trp Ile Tyr Trp Val Gly
1 5 10 15

Pro Ile Ile Gly
20

<210> 1168
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1168

Ala Val Leu Ala Gly Gly Leu Tyr Glu Tyr Val Phe Cys Pro Asp Val
1 5 10 15

Glu Phe Lys Arg
20

<210> 1169
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1169

Asp Leu Ile Leu Lys Pro Gly Val Val His Val Ile Asp Val Asp Arg
1 5 10 15

Gly Glu Glu Lys
20

<210> 1170
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1170

Glu Asp Asn Arg Ser Gln Val Glu Thr Asp Asp Leu Ile Leu Lys Pro
1 5 10 15

Gly Val Val His
20

<210> 1171
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1171

Gly Ile Leu Tyr Leu Val Thr Pro Pro Ser Val Val Gly Gly Leu Gly
1 5 10 15

Val Thr Met Val
20

<210> 1172
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1172

Gly Lys Cys Gly Pro Leu Cys Thr Arg Glu Asn Ile Met Val Ala Phe
1 5 10 15

Lys Gly Val Trp
20

<210> 1173
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1173

Gly Thr Glu Lys Pro Leu Pro Val Asp Met Val Leu Ile Ser Leu Cys
1 5 10 15

Phe Gly Leu Ser
20

<210> 1174
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1174

His Gly Asn Leu Thr Ala Gly His Gly Leu Leu Val Glu Leu Ile Ile
1 5 10 15

Thr Phe Gln Leu
20

<210> 1175
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1175

His Leu Phe Ala Ile Asn Tyr Thr Gly Ala Ser Met Asn Pro Ala Arg
1 5 10 15

Ser Phe Gly Pro
20

<210> 1176
<211> 20

<212> PRT
<213> Homo sapiens

<400> 1176

Ile Ala Thr Met Val Gln Cys Phe Gly His Ile Ser Gly Gly His Ile
1 5 10 15

Asn Pro Ala Val
20

<210> 1177
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1177

Ile Ser Gly Gly His Ile Asn Pro Ala Val Thr Val Ala Met Val Cys
1 5 10 15

Thr Arg Lys Ile
20

<210> 1178
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1178

Lys Arg Thr Asp Val Thr Gly Ser Ile Ala Leu Ala Ile Gly Phe Ser
1 5 10 15

Val Ala Ile Gly
20

<210> 1179
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1179

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

Pro Val Asp Met
20

<210> 1180
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1180

Met Ser Asp Arg Pro Thr Ala Arg Arg Trp Gly Lys Cys Gly Pro Leu
1 5 10 15

Cys Thr Arg Glu
20

<210> 1181
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1181

Asn Ile Met Val Ala Phe Lys Gly Val Trp Thr Gln Ala Phe Trp Lys
1 5 10 15

Ala Val Thr Ala
20

<210> 1182
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1182

Gln Gln Thr Lys Gly Ser Tyr Met Glu Val Glu Asp Asn Arg Ser Gln
1 5 10 15

Val Glu Thr Asp
20

<210> 1183
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1183

Arg Phe Lys Glu Ala Phe Ser Lys Ala Ala Gln Gln Thr Lys Gly Ser
1 5 10 15

Tyr Met Glu Val
20

<210> 1184
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1184

Ser Ile Ala Lys Ser Val Phe Tyr Ile Ala Ala Gln Cys Leu Gly Ala

1 5 10 15

Ile Ile Gly Ala
20

<210> 1185
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1185

Ser Met Asn Pro Ala Arg Ser Phe Gly Pro Ala Val Ile Met Gly Asn
1 5 10 15

Trp Glu Asn His
20

<210> 1186
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1186

Thr Gln Ala Phe Trp Lys Ala Val Thr Ala Glu Phe Leu Ala Met Leu
1 5 10 15

Ile Phe Val Leu
20

<210> 1187
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1187

Thr Val Ala Met Val Cys Thr Arg Lys Ile Ser Ile Ala Lys Ser Val
1 5 10 15

Phe Tyr Ile Ala
20

<210> 1188
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1188

Val Phe Cys Pro Asp Val Glu Phe Lys Arg Arg Phe Lys Glu Ala Phe
1 5 10 15

Ser Lys Ala Ala
20

<210> 1189
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1189

Val Phe Thr Ile Phe Ala Ser Cys Asp Ser Lys Arg Thr Asp Val Thr
1 5 10 15

Gly Ser Ile Ala
20

<210> 1190
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1190

Val Val Gly Gly Leu Gly Val Thr Met Val His Gly Asn Leu Thr Ala
1 5 10 15

Gly His Gly Leu
20

<210> 1191
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1191

Trp Ile Tyr Trp Val Gly Pro Ile Ile Gly Ala Val Leu Ala Gly Gly
1 5 10 15

Leu Tyr Glu Tyr
20

<210> 1192
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1192

Asn Ala Thr Gly Met Glu Val Gly Trp Tyr Arg Pro Pro Phe Ser Arg
1 5 10 15

Val Val His

<210> 1193
<211> 12
<212> PRT
<213> Homo sapiens

<400> 1193

Arg Ala Leu Val Gly Asp Glu Val Glu Leu Pro Cys
1 5 10

<210> 1194
<211> 21
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1194

Thr Pro Arg Val Glu Arg Phe Gly His Ser Val Phe Leu Ala Pro Tyr
1 5 10 15

Gly Trp Met Val Lys
20

<210> 1195
<211> 21
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1195

Thr Pro Arg Val Glu Arg Gly Gly His Ser Val Phe Leu Ala Pro Tyr
1 5 10 15

Gly Trp Met Val Lys
20

<210> 1196
<211> 21
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1196

Thr Pro Arg Val Glu Arg Gln Gly His Ser Val Phe Leu Ala Pro Tyr
1 5 10 15

Gly Trp Met Val Lys

20

<210> 1197
<211> 15
<212> PRT
<213> Homo sapiens

<400> 1197

Glu Lys Lys Gly Lys Asp Gln Ser Gly Glu Val Leu Ser Ser Val
1 5 10 15

<210> 1198
<211> 24
<212> PRT
<213> Homo sapiens

<400> 1198

Phe Cys Pro Asp Val Glu Phe Lys Arg Arg Phe Lys Glu Ala Phe Ser
1 5 10 15

Lys Ala Ala Gln Gln Thr Lys Gly
20

<210> 1199
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1199

Asp Pro Gly Gln Leu Arg Leu Trp Arg Leu Ala Ser
1 5 10

<210> 1200
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1200

Phe His Gln Pro Thr Tyr Asp Tyr Thr Val Ser Arg
1 5 10

<210> 1201
<211> 12
<212> PRT
<213> Unknown

<220>

<223> epitope involved in multiple sclerosis

<400> 1201

Phe Ser Lys Thr Glu Pro Leu Ser Pro Ser Trp Phe
1 5 10

<210> 1202
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1202

Gly Thr Trp Ile Cys Asp Phe Lys Ser Cys Ser Trp
1 5 10

<210> 1203
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1203

His Ile Asp Val Ser Arg Pro Trp Arg Val Thr Gly
1 5 10

<210> 1204
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1204

His Trp Arg His Trp Leu Ala Asp Thr Ala Phe Pro
1 5 10

<210> 1205
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1205

His Tyr Asn Pro Trp Glu Gln Glu Pro Met Met Tyr
1 5 10

<210> 1206
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1206

Asn Ala Leu Thr Glu Ser Lys Tyr Val Lys Leu Leu
1 5 10

<210> 1207
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1207

Asn Cys Ala Phe Trp Leu Gly Lys Leu Tyr Cys Arg
1 5 10

<210> 1208
<211> 12
<212> PRT
<213> Homo sapiens

<400> 1208

Asn Cys Ser Trp Cys His Val Leu Gln Arg Cys Ser
1 5 10

<210> 1209
<211> 10
<212> PRT
<213> Prochlorococcus marinus

<400> 1209

Asn Cys Trp Lys Pro Gln Val Leu His Cys
1 5 10

<210> 1210
<211> 12
<212> PRT
<213> Unknown

<220>
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<400> 1210

Asn Asn Leu Thr Gln Ser Lys Phe Leu Arg Leu Gln
1 5 10

<210> 1211
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1211

Asn Asn Pro Ala Pro Val Tyr Thr His Arg Val Leu
1 5 10

<210> 1212
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1212

Asn Pro Val Glu His Trp Leu Ala Val Leu Pro Thr
1 5 10

<210> 1213
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1213

Asn Tyr Pro Ser Trp Leu His Ala Tyr Arg Leu Ala
1 5 10

<210> 1214
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1214

Gln His Asn Val Ser Arg Pro Trp Val Leu Phe Thr
1 5 10

<210> 1215
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1215

Ser Cys Asn Tyr His Gly Arg Thr Leu Thr Cys Trp
1   5   10

<210> 1216
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1216

Ser Cys Asn Tyr His His Thr Tyr Leu Thr Cys Trp
1   5   10

<210> 1217
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1217

Ser Cys Gln Leu Val Arg Thr Ile Trp Ser Cys Ser
1   5   10

<210> 1218
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1218

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

<210> 1219
<211> 12
<212> PRT
<213> Unknown

<220>
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<400> 1219

Ser Thr Leu Ser Glu Ser Lys Val Asn Arg Leu Leu
1   5   10

<210> 1220
<211> 12
<212> PRT
<213> Unknown

<220>
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<400> 1220

Thr Ala Gln Asp Ile Ser Arg Pro Trp Trp Phe Pro
1 5 10

<210> 1221
<211> 12
<212> PRT
<213> Unknown

<220>
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<400> 1221

Thr Ile Met Asp Ile Ser Arg Thr Trp Thr Lys Val
1 5 10

<210> 1222
<211> 12
<212> PRT
<213> Unknown

<220>
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<400> 1222

Thr Asn Thr Leu Thr Pro His Lys Leu Gln Met Leu
1 5 10

<210> 1223
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1223

Thr Pro Gln Gln Asp Leu Tyr Asp Ile Met Tyr Asp
1 5 10

<210> 1224
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1224

Thr Gln Gly Leu Lys Tyr Trp Tyr Pro Val Trp Ser
1   5   10

<210> 1225
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1225

Val Pro Gln Lys Tyr Trp Trp Leu Ser Asp His Thr
1   5   10

<210> 1226
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1226

Val Val Pro Lys Tyr Trp Trp Ser Ala Glu Leu Pro
1   5   10

<210> 1227
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1227

Trp His Trp Arg Gln Pro Thr Trp Leu Gln Val Ile
1   5   10

<210> 1228
<211> 11
<212> PRT
<213> Homo sapiens

<400> 1228

Phe Phe Arg Asp His Ser Tyr Gln Glu Glu Ala
1   5   10

<210> 1229

<211> 11
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1229

Phe Phe Arg Asp His Ser Tyr Gln Ser Glu Ala
1 5 10

<210> 1230
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1230

Ala Pro Ala His His Pro Pro
1 5

<210> 1231
<211> 7
<212> PRT
<213> Unknown

<220>
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<400> 1231

Ala Pro Ala His Gln Ile Pro
1 5

<210> 1232
<211> 7
<212> PRT
<213> Unknown

<220>
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<400> 1232

Ala Pro Pro His Leu Pro Pro
1 5

<210> 1233
<211> 7
<212> PRT
<213> Unknown

<220>
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<400> 1233

Ala Pro Pro His Gln Met Pro
1 5

<210> 1234
<211> 7
<212> PRT
<213> Unknown

<220>
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<400> 1234

Ala Pro Pro His Val Met Pro
1 5

<210> 1235
<211> 7
<212> PRT
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<220>
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<400> 1235

Ala Pro Ser His Pro Pro Pro
1 5

<210> 1236
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1236

Glu Phe Gly Thr Phe Leu Trp
1 5

<210> 1237
<211> 6
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1237

Phe Gly Thr Tyr Leu Trp
1 5

<210> 1238

<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1238

Phe His Leu Pro Trp Met Gln
1 5

<210> 1239
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1239

Gly Pro Val Asn Met Asn Leu
1 5

<210> 1240
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1240

Gly Arg Gln Ala Gln Tyr Tyr
1 5

<210> 1241
<211> 11
<212> PRT
<213> Human herpesvirus

<400> 1241

Gly Arg Arg Pro Phe Phe His Pro Val Gly Glu
1 5 10

<210> 1242
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1242

Ile Leu Asn Trp His Gln Phe

1 5

<210> 1243
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1243

Lys Phe Gly Thr Ala Leu Trp
1 5

<210> 1244
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1244

Lys Trp Pro Ile Ile Asp Thr
1 5

<210> 1245
<211> 6
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1245

Leu Asn Trp Asn Pro Phe
1 5

<210> 1246
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1246

Met Phe Asn Trp His Pro Phe
1 5

<210> 1247
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1247

Met Gln Ala His Gln Thr Lys
1 5

<210> 1248
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1248

Pro Leu Glu Leu Ser Val Tyr
1 5

<210> 1249
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1249

Pro Val Glu Leu Gln Leu Tyr
1 5

<210> 1250
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1250

Pro Val Gly Pro Trp Thr Asn
1 5

<210> 1251
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1251

Gln Phe Gly Thr Phe Leu Trp

1 5

<210> 1252
<211> 8
<212> PRT
<213> Homo sapiens

<400> 1252

Ser Phe Asp Gly Thr Phe Leu Trp
1 5

<210> 1253
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1253

Ser Phe Gly Thr Ala Leu Trp
1 5

<210> 1254
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1254

Ser Phe Gly Thr Phe Leu Trp
1 5

<210> 1255
<211> 7
<212> PRT
<213> Unknown

<220>
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<400> 1255

Ser Phe Gly Thr Ile Leu Trp
1 5

<210> 1256
<211> 7
<212> PRT
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<220>
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<400> 1256

Ser His Arg Pro Thr Thr Gln
1 5

<210> 1257
<211> 7
<212> PRT
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<220>
<223> epitope involved in multiple sclerosis

<400> 1257

Ser Gln Ser Val Ala Ala Ser
1 5

<210> 1258
<211> 7
<212> PRT
<213> Unknown

<220>
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<400> 1258

Ser Thr Glu Gly Arg His Asn
1 5

<210> 1259
<211> 7
<212> PRT
<213> Unknown

<220>
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<400> 1259

Thr Val Gln Pro Gln Phe His
1 5

<210> 1260
<211> 7
<212> PRT
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<220>
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<400> 1260

Thr Tyr Met Val Pro Ala Pro
1 5

<210> 1261
<211> 8
<212> PRT
<213> Unknown

<220>
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<400> 1261

Val Leu Asn Arg Trp Asn Pro Phe
1 5

<210> 1262
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1262

Val Leu Asn Trp His Pro Phe
1 5

<210> 1263
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1263

Trp Gly Leu Asp Asn Pro Pro
1 5

<210> 1264
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1264

Trp Tyr Tyr Lys Pro Pro Ala
1 5

<210> 1265
<211> 9
<212> PRT
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<400> 1265

Arg Pro Arg Thr Pro Pro Pro Ser Tyr
1 5

<210> 1266
<211> 8
<212> PRT
<213> Homo sapiens

<400> 1266

Thr Pro Arg Thr Pro Pro Pro Gln
1 5

<210> 1267
<211> 13
<212> PRT
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<400> 1267

Phe Ser Trp Gly Ala Glu Gly Gln Arg Pro Gly Phe Gly
1 5 10

<210> 1268
<211> 25
<212> PRT
<213> Homo sapiens

<400> 1268

Ser Ile Ala Phe Pro Ser Lys Thr Ser Ala Ser Ile Gly Ser Leu Cys
1 5 10 15

Ala Asp Ala Arg Met Tyr Gly Val Leu
20 25

<210> 1269
<211> 17
<212> PRT
<213> Homo sapiens

<400> 1269

Ser Leu Cys Phe Gly Leu Ser Ile Ala Thr Met Val Gln Cys Phe Gly
1 5 10 15

His

<210> 1270
<211> 18
<212> PRT
<213> Homo sapiens

<400> 1270

Val Ile Asp Val Asp Arg Gly Glu Glu Lys Lys Gly Lys Asp Gln Ser
1 5 10 15

Gly Glu

<210> 1271
<211> 11
<212> PRT
<213> Homo sapiens

<400> 1271

Gly Asp Glu Val Glu Leu Pro Cys Arg Ile Ser
1 5 10

<210> 1272
<211> 14
<212> PRT
<213> Homo sapiens

<400> 1272

Leu Thr Val Gly Leu Thr Arg Arg Gly Gln Pro Arg Gln Tyr
1 5 10

<210> 1273
<211> 14
<212> PRT
<213> Homo sapiens

<400> 1273

Leu Thr Val Gly Leu Thr Arg Arg Gly Gln Pro Arg Gln Tyr
1 5 10

<210> 1274
<211> 13
<212> PRT
<213> Homo sapiens

<400> 1274

Tyr Asn Gln Tyr Ser Gln Arg Tyr His Gln Arg Thr Asn
1 5 10

<210> 1275
<211> 13
<212> PRT
<213> Homo sapiens

<400> 1275

Tyr Asn Gln Tyr Ser Gln Arg Tyr His Gln Arg Thr Asn
1 5 10

<210> 1276
<211> 21
<212> PRT
<213> Homo sapiens

<400> 1276

Gly Ile Thr Val Ser Arg Asn Gly Ser Ser Val Phe Thr Thr Ser Gln
1 5 10 15

Asp Ser Thr Leu Lys
20

<210> 1277
<211> 21
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1277

Thr Cys Phe Phe Arg Asp Gly Asn Tyr Gln Glu Glu Ala Ala Met Glu
1 5 10 15

Leu Lys Val Glu Asp
20

<210> 1278
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1278

Thr Phe Arg Asp Leu Gly Asn Leu Thr His Leu Phe Leu His Gly Asn
1 5 10 15

Arg Ile Ser

<210> 1279
<211> 21
<212> PRT
<213> Unknown

<220>
<223> epitope involved in multiple sclerosis

<400> 1279

Thr Phe Arg Val Leu Arg Asn Gly Thr Ser Val Phe Leu His Pro Asn
1 5 10 15

Lys Trp Thr Val Lys

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<210> 1280
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1280

Thr Leu Ile Asn Leu Thr Asn Leu Thr His Leu Tyr Leu His Asn Asn
1 5 10 15

Lys Phe Thr

<210> 1281
<211> 21
<212> PRT
<213> Homo sapiens

<400> 1281

Val Val His Leu Tyr Arg Asn Gly Lys Asp Gln Asp Gly Asp Gln Ala
1 5 10 15

Pro Glu Tyr Arg Gly
20

<210> 1282
<211> 11
<212> PRT
<213> Homo sapiens

<400> 1282

Glu Arg Leu Gly Pro Leu Val Glu Gln Gly Arg
1 5 10

<210> 1283
<211> 15
<212> PRT
<213> Homo sapiens

<400> 1283

Lys Leu Thr Ser Glu Ala Arg Gly Arg Ile Pro Val Ala Gln Lys
1 5 10 15

<210> 1284
<211> 27
<212> PRT
<213> Homo sapiens

<400> 1284

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

1 5 10 15

Arg Glu Ile Val Arg Asp Ile Lys Glu Lys Leu
20 25

<210> 1285
<211> 15
<212> PRT
<213> Homo sapiens

<400> 1285

Ala His Tyr Gly Ser Leu Pro Gln Lys Ser His Gly Arg Thr Gln
1 5 10 15

<210> 1286
<211> 15
<212> PRT
<213> Homo sapiens

<400> 1286

Asp Pro Val Val His Phe Phe Lys Asn Ile Val Thr Pro Arg Thr
1 5 10 15

<210> 1287
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1287

Gly Lys Gly Arg Gly Leu Ser Leu Ser Arg Phe Ser Trp Gly Ala Glu
1 5 10 15

<210> 1288
<211> 7
<212> PRT
<213> Homo sapiens

<400> 1288

Gly Leu Gln Leu Tyr Phe Ser
1 5

<210> 1289
<211> 15
<212> PRT
<213> Homo sapiens

<400> 1289

Gly Gln Arg Pro Gly Phe Gly Tyr Gly Gly Arg Ala Ser Asp Tyr
1 5 10 15

<210> 1290

<211> 15
<212> PRT
<213> Homo sapiens

<400> 1290

Ile Leu Asp Ser Ile Gly Arg Phe Phe Gly Gly Asp Arg Gly Ala
1 5 10 15

<210> 1291
<211> 15
<212> PRT
<213> Homo sapiens

<400> 1291

Pro Lys Arg Gly Ser Gly Lys Asp Ser His His Pro Ala Arg Thr
1 5 10 15

<210> 1292
<211> 21
<212> PRT
<213> Homo sapiens

<400> 1292

Tyr Leu Ala Ser Ala Ser Thr Met Asp His Ala Arg His Gly Phe Leu
1 5 10 15

Pro Arg Arg His Arg
20

<210> 1293
<211> 26
<212> PRT
<213> Zea mays

<400> 1293

Phe Thr Gly Ala Ser Met Asn Pro Ala Arg Ser Phe Gly Pro Ala Leu
1 5 10 15

Ala Thr Gly Asp Trp Thr Asn His Trp Val
20 25

<210> 1294
<211> 26
<212> PRT
<213> Homo sapiens

<400> 1294

Tyr Thr Gly Ala Ser Met Asn Pro Ala Arg Ser Phe Gly Pro Ala Val
1 5 10 15

Ile Met Gly Asn Trp Glu Asn His Trp Ile

20 25

<210> 1295
<211> 20
<212> PRT
<213> Triticum aestivum

<400> 1295

Ala Met Cys Asn Val Tyr Ile Pro Pro Tyr Cys Ala Met Ala Pro Phe
1 5 10 15

Gly Ile Phe Gly
20

<210> 1296
<211> 8
<212> PRT
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<400> 1296

Glu Leu Pro Tyr Pro Gln Pro Gln
1 5

<210> 1297
<211> 8
<212> PRT
<213> Triticum aestivum

<400> 1297

Phe Pro Gln Pro Glu Leu Pro Tyr
1 5

<210> 1298
<211> 10
<212> PRT
<213> Triticum aestivum

<400> 1298

Phe Pro Gln Pro Gln Pro Phe Pro Pro Gln
1 5 10

<210> 1299
<211> 10
<212> PRT
<213> Triticum aestivum

<400> 1299

Phe Pro Gln Pro Gln Gln Gln Phe Pro Gln
1 5 10

<210> 1300

<211> 13
<212> PRT
<213> Triticum aestivum

<400> 1300

Phe Pro Gln Gln Pro Gln Gln Pro Phe Pro Gln Gln Pro
1 5 10

<210> 1301
<211> 12
<212> PRT
<213> Triticum aestivum

<400> 1301

Phe Pro Gln Gln Pro Gln Gln Pro Tyr Pro Gln Gln
1 5 10

<210> 1302
<211> 13
<212> PRT
<213> Triticum aestivum

<400> 1302

Phe Pro Gln Gln Pro Gln Gln Pro Tyr Pro Gln Gln Pro
1 5 10

<210> 1303
<211> 13
<212> PRT
<213> Triticum aestivum

<400> 1303

Phe Pro Gln Gln Pro Gln Gln Pro Tyr Pro Gln Gln Pro
1 5 10

<210> 1304
<211> 15
<212> PRT
<213> Triticum aestivum

<400> 1304

Phe Pro Gln Gln Pro Gln Gln Pro Tyr Pro Gln Gln Pro Gln Gln
1 5 10 15

<210> 1305
<211> 10
<212> PRT
<213> Triticum aestivum

<400> 1305

Phe Pro Ser Gln Gln Pro Tyr Leu Gln Leu
1 5 10

<210> 1306
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1306

Phe Ser Gln Pro Glu Gln Glu Phe Pro Gln Pro Gln
1 5 10

<210> 1307
<211> 12
<212> PRT
<213> Triticum aestivum

<400> 1307

Phe Ser Gln Pro Gln Gln Gln Phe Pro Gln Pro Gln
1 5 10

<210> 1308
<211> 11
<212> PRT
<213> Unknown

<220>
<223> eptiope involved in celiac disease

<400> 1308

Gly Ile Ile Gln Pro Glu Gln Pro Ala Gln Leu
1 5 10

<210> 1309
<211> 11
<212> PRT
<213> Triticum aestivum

<400> 1309

Gly Ile Ile Gln Pro Gln Gln Pro Ala Gln Leu
1 5 10

<210> 1310
<211> 15
<212> PRT
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<400> 1310

Gly Ser Phe Gln Pro Ser Gln Gln Asn Pro Gln Ala Gln Gly Ser
1 5 10 15

<210> 1311
<211> 20
<212> PRT
<213> Triticum aestivum

<400> 1311

His Gln Pro Gln Gln Thr Phe Pro Gln Pro Gln Gln Thr Tyr Pro His
1 5 10 15

Gln Pro Gln Gln
20

<210> 1312
<211> 20
<212> PRT
<213> Triticum aestivum

<400> 1312

Ile His Ser Val Ala His Ser Ile Ile Met Gln Gln Glu Gln Gln Gln
1 5 10 15

Gly Val Pro Ile
20

<210> 1313
<211> 10
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1313

Ile Ile Gln Pro Glu Gln Pro Ala Gln Leu
1 5 10

<210> 1314
<211> 9
<212> PRT
<213> Triticum aestivum

<400> 1314

Ile Ile Gln Pro Gln Gln Pro Ala Gln
1 5

<210> 1315
<211> 10
<212> PRT
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<400> 1315

Ile Ile Gln Pro Gln Gln Pro Ala Gln Leu

1 5 10

<210> 1316
<211> 20
<212> PRT
<213> Triticum aestivum

<400> 1316

Leu Gly Ile Ile Gln Pro Gln Gln Pro Ala Gln Leu Glu Gly Ile Arg
1 5 10 15

Ser Leu Val Leu
20

<210> 1317
<211> 12
<212> PRT
<213> Triticum aestivum

<400> 1317

Leu Gly Gln Gly Ser Phe Arg Pro Ser Gln Gln Asn
1 5 10

<210> 1318
<211> 17
<212> PRT
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<400> 1318

Leu Gly Gln Gln Gln Pro Phe Pro Pro Gln Gln Pro Tyr Pro Gln Pro
1 5 10 15

Gln

<210> 1319
<211> 19
<212> PRT
<213> Triticum aestivum

<400> 1319

Leu Gly Gln Gln Gln Pro Phe Pro Pro Gln Gln Pro Tyr Pro Gln Pro
1 5 10 15

Gln Pro Phe

<210> 1320
<211> 20
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1320

Leu Gln Leu Gln Pro Phe Pro Gln Pro Glu Lys Pro Tyr Pro Gln Pro
1   5   10   15

Glu Lys Pro Tyr
            20

<210> 1321
<211> 20
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1321

Leu Gln Leu Gln Pro Phe Pro Gln Pro Glu Lys Pro Tyr Pro Gln Pro
1   5   10   15

Glu Leu Pro Tyr
            20

<210> 1322
<211> 20
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1322

Leu Gln Leu Gln Pro Phe Pro Gln Pro Glu Lys Pro Tyr Pro Gln Pro
1   5   10   15

Glu Leu Pro Tyr
            20

<210> 1323
<211> 20
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1323

Leu Gln Leu Gln Pro Phe Pro Gln Pro Glu Leu Pro Tyr Pro Gln Pro
1   5   10   15

Glu Lys Pro Tyr
            20

<210> 1324
<211> 20
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1324

Leu Gln Leu Gln Pro Phe Pro Gln Pro Glu Leu Pro Tyr Pro Gln Pro
1   5   10   15

Glu Leu Pro Tyr
            20

<210> 1325
<211> 33
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1325

Leu Gln Leu Gln Pro Phe Pro Gln Pro Glu Leu Pro Tyr Pro Gln Pro
1   5   10   15

Glu Leu Pro Tyr Pro Gln Pro Glu Leu Pro Tyr Pro Gln Pro Gln Pro
            20   25   30

Phe

<210> 1326
<211> 13
<212> PRT
<213> Triticum aestivum

<400> 1326

Leu Gln Leu Gln Pro Phe Pro Gln Pro Gln Leu Pro Tyr
1   5   10

<210> 1327
<211> 13
<212> PRT
<213> Triticum aestivum

<400> 1327

Leu Gln Leu Gln Pro Phe Pro Gln Pro Gln Leu Pro Tyr
1   5   10

<210> 1328
<211> 20
<212> PRT
<213> Triticum aestivum

<400> 1328

Leu Gln Leu Gln Pro Phe Pro Gln Pro Gln Leu Pro Tyr Pro Gln Pro
1   5   10   15

Gln Leu Pro Tyr
            20

<210> 1329
<211> 20
<212> PRT
<213> Triticum aestivum

<400> 1329

Leu Gln Leu Gln Pro Phe Pro Gln Pro Gln Leu Pro Tyr Pro Gln Pro
1   5   10   15

Gln Leu Pro Tyr
            20

<210> 1330
<211> 32
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1330

Leu Gln Leu Gln Pro Phe Pro Gln Pro Gln Leu Pro Tyr Pro Gln Pro
1   5   10   15

Gln Leu Pro Tyr Pro Gln Pro Gln Leu Pro Tyr Pro Gln Pro Pro Phe
            20   25   30

<210> 1331
<211> 33
<212> PRT
<213> Triticum aestivum

<400> 1331

Leu Gln Leu Gln Pro Phe Pro Gln Pro Gln Leu Pro Tyr Pro Gln Pro
1   5   10   15

Gln Leu Pro Tyr Pro Gln Pro Gln Leu Pro Tyr Pro Gln Pro Gln Pro
20 25 30

Phe

<210> 1332
<211> 8
<212> PRT
<213> Triticum aestivum

<400> 1332

Leu Gln Pro Phe Pro Gln Pro Glu
1 5

<210> 1333
<211> 11
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1333

Leu Gln Pro Phe Pro Gln Pro Glu Leu Pro Tyr
1 5 10

<210> 1334
<211> 11
<212> PRT
<213> Triticum aestivum

<400> 1334

Leu Gln Pro Phe Pro Gln Pro Gln Leu Pro Tyr
1 5 10

<210> 1335
<211> 20
<212> PRT
<213> Triticum aestivum

<400> 1335

Leu Gln Pro Gln Gln Pro Phe Pro Gln Gln Pro Gln Gln Pro Tyr Pro
1 5 10 15

Gln Gln Pro Gln
20

<210> 1336
<211> 20
<212> PRT
<213> Triticum aestivum

<400> 1336

Leu Arg Pro Leu Phe Gln Leu Ala Gln Gly Leu Gly Ile Ile Gln Pro
1 5 10 15

Gln Gln Pro Ala
20

<210> 1337
<211> 12
<212> PRT
<213> Human adenovirus 12

<400> 1337

Leu Arg Arg Gly Met Phe Arg Pro Ser Gln Cys Asn
1 5 10

<210> 1338
<211> 8
<212> PRT
<213> Triticum aestivum

<400> 1338

Pro Glu Leu Pro Tyr Pro Gln Pro
1 5

<210> 1339
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1339

Pro Glu Gln Pro Gln Gln Ser Phe Pro Glu Gln Glu Arg Pro
1 5 10

<210> 1340
<211> 8
<212> PRT
<213> Triticum aestivum

<400> 1340

Pro Phe Pro Gln Pro Glu Leu Pro
1 5

<210> 1341
<211> 9
<212> PRT
<213> Triticum aestivum

<400> 1341

Pro Phe Pro Gln Pro Gln Leu Pro Tyr
1 5

<210> 1342
<211> 15
<212> PRT
<213> Triticum aestivum

<400> 1342

Pro Phe Pro Gln Pro Gln Leu Pro Tyr Pro Gln Pro Gln Leu Pro
1 5 10 15

<210> 1343
<211> 20
<212> PRT
<213> Triticum aestivum

<400> 1343

Pro Phe Pro Gln Pro Gln Gln Thr Phe Pro Gln Gln Pro Gln Leu Pro
1 5 10 15

Phe Pro Gln Gln
20

<210> 1344
<211> 20
<212> PRT
<213> Triticum aestivum

<400> 1344

Pro Phe Pro Gln Gln Pro Gln Gln Pro Phe Pro Gln Gln Pro Gln Gln
1 5 10 15

Ser Phe Pro Gln
20

<210> 1345
<211> 14
<212> PRT
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<400> 1345

Pro Phe Arg Pro Gln Gln Pro Tyr Pro Gln Pro Gln Pro Gln
1 5 10

<210> 1346
<211> 8
<212> PRT
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<400> 1346

Pro Phe Ser Gln Gln Gln Gln Gln
1 5

<210> 1347
<211> 10
<212> PRT
<213> Triticum aestivum

<400> 1347

Pro Phe Ser Gln Gln Gln Gln Ser Pro Phe
1 5 10

<210> 1348
<211> 20
<212> PRT
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<400> 1348

Pro Phe Thr Gln Pro Gln Gln Pro Thr Pro Ile Gln Pro Gln Gln Pro
1 5 10 15

Phe Pro Gln Gln
20

<210> 1349
<211> 8
<212> PRT
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<400> 1349

Pro Gln Pro Glu Leu Pro Tyr Pro
1 5

<210> 1350
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1350

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1 5

<210> 1351
<211> 11
<212> PRT
<213> Unknown

<220>

<223> epitope involved in celiac disease

<400> 1351

Pro Gln Pro Glu Leu Pro Tyr Pro Gln Pro Glu
1 5 10

<210> 1352
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1352

Pro Gln Pro Glu Leu Pro Tyr Pro Gln Pro Glu Leu Pro Tyr
1 5 10

<210> 1353
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1353

Pro Gln Pro Glu Leu Pro Tyr Pro Gln Pro Gln Leu Pro Tyr
1 5 10

<210> 1354
<211> 9
<212> PRT
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<400> 1354

Pro Gln Pro Gln Leu Pro Tyr Pro Gln
1 5

<210> 1355
<211> 12
<212> PRT
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<400> 1355

Pro Gln Pro Gln Leu Pro Tyr Pro Gln Pro Gln Leu
1 5 10

<210> 1356
<211> 14
<212> PRT
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<400> 1356

Pro Gln Pro Gln Leu Pro Tyr Pro Gln Pro Gln Leu Pro Tyr
1 5 10

<210> 1357
<211> 14
<212> PRT
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<400> 1357

Pro Gln Pro Gln Leu Pro Tyr Pro Gln Pro Gln Leu Pro Tyr
1 5 10

<210> 1358
<211> 14
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<400> 1358

Pro Gln Pro Gln Leu Pro Tyr Pro Gln Pro Gln Leu Pro Tyr
1 5 10

<210> 1359
<211> 20
<212> PRT
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<400> 1359

Pro Gln Pro Gln Gln Pro Gln Leu Pro Phe Pro Gln Gln Pro Gln Gln
1 5 10 15

Pro Phe Pro Gln
20

<210> 1360
<211> 5
<212> PRT
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<400> 1360

Pro Gln Gln Pro Phe
1 5

<210> 1361
<211> 20
<212> PRT
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<400> 1361

Pro Gln Gln Pro Phe Pro Gln Pro Gln Gln Pro Gln Gln Pro Phe Pro
1 5 10 15

Gln Ser Gln Gln
            20

<210> 1362
<211> 20
<212> PRT
<213> Triticum aestivum

<400> 1362

Pro Gln Gln Pro Phe Pro Gln Pro Gln Gln Gln Phe Pro Gln Pro Gln
1   5   10   15

Gln Pro Gln Gln
            20

<210> 1363
<211> 11
<212> PRT
<213> Triticum aestivum

<400> 1363

Pro Gln Gln Pro Phe Pro Gln Gln Pro Gln Gln
1   5   10

<210> 1364
<211> 11
<212> PRT
<213> Triticum aestivum

<400> 1364

Pro Gln Gln Pro Phe Pro Gln Gln Pro Gln Gln
1   5   10

<210> 1365
<211> 17
<212> PRT
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<400> 1365

Pro Gln Gln Pro Phe Pro Gln Gln Pro Gln Gln Pro Tyr Pro Gln Gln
1   5   10   15

Pro

<210> 1366
<211> 20
<212> PRT
<213> Triticum aestivum

<400> 1366

Pro Gln Gln Pro Phe Pro Gln Ser Gln Gln Pro Gln Gln Pro Phe Pro
1 5 10 15

Gln Pro Gln Gln
20

<210> 1367
<211> 20
<212> PRT
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<400> 1367

Pro Gln Gln Pro Gln Gln Pro Phe Pro Leu Gln Pro Gln Gln Pro Phe
1 5 10 15

Pro Gln Gln Pro
20

<210> 1368
<211> 14
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<400> 1368

Pro Gln Gln Pro Gln Gln Ser Phe Pro Gln Gln Gln Arg Pro
1 5 10

<210> 1369
<211> 14
<212> PRT
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<400> 1369

Pro Gln Gln Pro Gln Gln Ser Phe Pro Gln Gln Gln Arg Pro
1 5 10

<210> 1370
<211> 9
<212> PRT
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<400> 1370

Pro Gln Gln Ser Phe Pro Glu Gln Glu
1 5

<210> 1371
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<212> PRT
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<400> 1371

Pro Gln Gln Ser Phe Pro Gln Gln Gln
1 5

<210> 1372
<211> 14
<212> PRT
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<400> 1372

Pro Gln Thr Gln Gln Pro Gln Gln Pro Phe Pro Gln Pro Gln
1 5 10

<210> 1373
<211> 15
<212> PRT
<213> Triticum aestivum

<400> 1373

Pro Ser Gly Gln Gly Ser Phe Gln Pro Ser Gln Gln Asn Pro Gln
1 5 10 15

<210> 1374
<211> 9
<212> PRT
<213> Triticum aestivum

<400> 1374

Pro Tyr Pro Gln Pro Gln Leu Pro Tyr
1 5

<210> 1375
<211> 9
<212> PRT
<213> Triticum aestivum

<400> 1375

Pro Tyr Pro Gln Pro Gln Leu Pro Tyr
1 5

<210> 1376
<211> 15
<212> PRT
<213> Triticum aestivum

<400> 1376

Gln Ala Gln Gly Ser Val Gln Pro Gln Gln Leu Pro Gln Phe Glu
1 5 10 15

<210> 1377
<211> 20

<212> PRT
<213> Triticum aestivum

<400> 1377

Gln Phe Pro Gln Pro Gln Gln Pro Gln Gln Ser Phe Pro Gln Gln Gln
1 5 10 15

Gln Pro Ala Ile
20

<210> 1378
<211> 20
<212> PRT
<213> Triticum aestivum

<400> 1378

Gln Phe Pro Gln Thr Gln Gln Pro Gln Gln Pro Phe Pro Gln Pro Gln
1 5 10 15

Gln Thr Phe Pro
20

<210> 1379
<211> 10
<212> PRT
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<400> 1379

Gln Phe Gln Gly Gln Gln Gln Pro Phe Pro
1 5 10

<210> 1380
<211> 15
<212> PRT
<213> Aegilops markgrafii

<400> 1380

Gln Gly Gln Gln Gly Tyr Tyr Pro Thr Ser Pro Gln Gln Ser Gly
1 5 10 15

<210> 1381
<211> 10
<212> PRT
<213> Triticum aestivum

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Gln Gly Gln Gln Gln Pro Phe Pro Pro Gln
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Ser

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Ser

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Ser

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Gln Pro Gln

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1 5 10

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1 5 10 15

Pro Tyr Pro Gln
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Gln Arg Pro Phe
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Gln Thr Phe His
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Gln Gln Pro Phe Pro
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Gln Pro Ile Pro
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Ser Gln Gln Pro
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Gln Gln Pro Pro Phe Ser Gln Gln Gln Gln Gln Pro Leu Pro Gln
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Gln Pro Gln Gln

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Leu Gln Leu Gln
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1 5 10 15

Gln Thr Tyr Pro
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Gln Gln Gln Pro Phe Pro Pro Gln Gln Pro
1 5 10

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Gln Gln Gln Gln Pro Pro Phe Ser Gln Gln Gln Gln Ser Pro Phe Ser
1 5 10 15

Gln Gln Gln Gln
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<400> 1431

Gln Gln Thr Tyr Pro His Gln Pro Gln Gln Gln Phe Pro Gln Thr Gln
1 5 10 15

Gln Pro Gln Gln
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Gln Pro Gln Gln Phe
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Pro Gln Ala

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Gln Ser Glu Gln Ser Gln Gln Pro Phe Gln Pro Gln
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Gln Ser Phe Leu Gln Gln Gln Met Asn Pro Cys Lys Asn Phe Leu Leu
1 5 10 15

Gln Gln Cys Asn
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<210> 1436
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<400> 1436

Gln Thr Gln Gln Pro Gln Gln Pro Phe Pro Gln Gln Pro Gln Gln Pro
1 5 10 15

Phe Pro Gln Thr
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<210> 1437
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Gln Val Pro Leu Val Gln Gln Gln Gln Phe Leu Gly Gln Gln Gln Pro
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Phe Pro Pro Gln
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<400> 1439

Ser Phe Pro Gln Gln Gln Gln Pro Ala Ile Gln Ser Phe Leu Gln Gln
1 5 10 15

Gln Met Asn Pro
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Ser Phe Gln Gln Pro Gln Gln Gln Tyr Pro
1 5 10

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Ser Gly Gln Gly Ser Phe Gln Pro Ser Gln Gln Asn
1 5 10

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Ser Gly Gln Gly Ser Phe Gln Pro Ser Gln Gln Asn Pro Gln
1 5 10

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<400> 1443

Ser Gln Gln Pro Tyr Leu Gln Leu Gln Pro Phe Pro Gln Pro Gln Leu
1 5 10 15

Pro Tyr Ser Gln
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<400> 1444

Thr Ile Pro Gln Pro His Gln Thr Phe His His Gln Pro Gln Gln Thr
1 5 10 15

Phe Pro Gln Pro
20

<210> 1445
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<400> 1445

Thr Pro Ile Gln Pro Gln Gln Pro Phe Pro Gln Gln Pro Gln Gln Pro
1 5 10 15

Gln Gln Pro Phe
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Val Gln Gly Gln Gly Ile Ile Gln Pro Gln Gln Pro Ala Gln Leu
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Val Tyr Ile Pro Pro Tyr Cys Thr Ile Ala Pro Phe Gly Ile Phe Gly
1 5 10 15

Thr Asn Tyr Arg
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1 5 10 15

Gln Pro Gln Arg
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Tyr Leu Gln Leu Gln Pro Phe Pro Gln Pro Gln Leu Pro Tyr Pro
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1 5 10 15

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Tyr Pro Gln Pro Gln Pro Phe Pro Ser Gln
1 5 10

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Tyr Pro Ser Gly Gln Gly Ser Phe Gln Pro Ser Gln Gln Asn Pro
1 5 10 15

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Tyr Gln Gln Leu Pro Gln Pro Gln Gln Pro Gln Gln Ser Phe Pro Gln
1 5 10 15

Gln Gln Arg Pro Phe
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1 5

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1 5

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Ser Gln Pro Gln Gln Gln Phe Pro Gln
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<400> 1461

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1 5 10 15

Pro Gln

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Phe Pro Gly Gln Gln Gln Pro Phe Pro Pro Gln Gln Pro Tyr Pro Gln
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Pro Gln Pro Phe
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1 5 10

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1 5 10 15

Gln Pro Gln

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Gln Gln

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Val Arg Val Pro Val Pro Gln Leu Gln Pro Gln Asn Pro Ser Gln Gln
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Gln Pro Gln

<210> 1467
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<400> 1467

Gln Pro Gln Gln Pro Gln Gln Ser Phe Pro Gln Gln Gln Arg Pro
1 5 10 15

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<400> 1468

Val Arg Val Pro Val Pro Gln Leu
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<210> 1469
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<212> PRT
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1 5 10 15

Glu Leu Pro Tyr
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<400> 1470

Leu Gln Pro Phe Pro Gln Pro Glu Leu Pro Tyr
1 5 10

<210> 1471
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<400> 1471

Gln Tyr Gln Pro Tyr Pro Glu Gln Gln Gln Pro Phe Val Gln
1 5 10

<210> 1472
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<400> 1472

Ser Glu Gln Tyr Gln Pro Tyr Pro Glu Gln Gln Glu Pro Phe Val Gln
1 5 10 15

Gln Gln Gln

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<400> 1473

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1 5 10 15

Glu Gln Gln Glu Pro Phe
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<210> 1474
<211> 22
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<400> 1474

Thr Thr Thr Val Gln Tyr Asn Pro Ser Glu Gln Tyr Gln Pro Tyr Pro
1 5 10 15

Glu Gln Gln Glu Pro Phe
20

<210> 1475
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<400> 1475

Tyr Gln Pro Tyr Pro Glu Gln Gln Glu Pro Phe Val
1 5 10

<210> 1476
<211> 17
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<400> 1476

Phe Pro Gln Pro Gln Leu Pro Tyr Pro Gln Pro Gln Ser Gln Val Leu
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Gln

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Leu Gln Leu Gln Pro Phe Pro Gln Pro Gln Leu Pro Tyr Pro Gln
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Ala Ala Glu Lys Gln Met Lys Asp Lys Gln
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<210> 1479
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Ala Glu Asp Lys Glu Asp Asp Ala Glu Asp
1 5 10

<210> 1480
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Ala Lys Ile Asp Asp Pro Thr Asp Ser Lys
1 5 10

<210> 1481
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<400> 1481

Ala Ser Phe Ala Glu Ala Pro Phe Ser Asn
1 5 10

<210> 1482
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Asp Ala Glu Asp Lys Asp Glu Asp Glu Glu
1 5 10

<210> 1483
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<400> 1483

Asp Glu Glu Asp Lys Glu Glu Asp Glu Glu
1 5 10

<210> 1484
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Glu Asp Asp Ala Glu Asp Lys Asp Glu Asp
1 5 10

<210> 1485
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<212> PRT
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<400> 1485

Glu Asp Glu Glu Asp Glu Glu Asp Lys Glu
1 5 10

<210> 1486
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<400> 1486

Glu Asp Lys Asp Glu Asp Glu Glu Asp Glu
1 5 10

<210> 1487
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<400> 1487

Glu Asp Lys Glu Glu Asp Glu Glu Glu Asp
1 5 10

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Glu Asp Lys Lys Arg Lys Glu Glu Glu Glu
1 5 10

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1 5 10

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<400> 1490

Glu Glu Asp Glu Glu Asp Lys Glu Glu Asp
1 5 10

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Glu Glu Glu Asp Lys Lys Arg Lys Glu Glu
1 5 10

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Glu Glu Glu Glu Ala Glu Asp Lys Glu Asp
1 5 10

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Glu Lys Asp Lys Gly Leu Gln Thr Ser Gln
1 5 10

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<400> 1494

Glu Lys Gln Met Lys Asp Lys Gln Asp Glu
1 5 10

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<400> 1495

Glu Gln Arg Leu Lys Glu Glu Glu Glu Asp
1 5 10

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<400> 1496

Phe Ala Glu Ala Pro Phe Ser Asn Lys Gly
1 5 10

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Gly Leu Gln Thr Ser Gln Asp Ala Arg Phe
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<400> 1498

Gly Val Thr Lys Ala Ala Glu Lys Gln Met

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<210> 1499
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<400> 1499

Ile Phe Asp Asn Phe Leu Ile Thr Asn Asp
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<210> 1500
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Lys Asp Glu Asp Glu Glu Asp Glu Glu Asp
1 5 10

<210> 1501
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<400> 1501

Lys Glu Glu Glu Glu Asp Lys Lys Arg Lys
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<210> 1502
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<400> 1502

Lys Gly Lys Asn Val Leu Ile Asn Lys Asp
1 5 10

<210> 1503
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<400> 1503

Lys Ile Lys Asp Pro Asp Ala Ser Lys Pro
1 5 10

<210> 1504
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<400> 1504

Lys Leu Phe Pro Asn Ser Leu Asp Gln Thr
1 5 10

<210> 1505
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<400> 1505

Lys Gln Asp Glu Glu Gln Arg Leu Lys Glu
1 5 10

<210> 1506
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<400> 1506

Lys Ser Gly Thr Ile Phe Asp Asn Phe Leu
1 5 10

<210> 1507
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<400> 1507

Leu Pro Pro Lys Lys Ile Lys Asp Pro Asp
1 5 10

<210> 1508
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<400> 1508

Gln Val Lys Ser Gly Thr Ile Phe Asp Asn
1 5 10

<210> 1509
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<400> 1509

Arg Lys Glu Glu Glu Glu Ala Glu Asp Lys
1 5 10

<210> 1510
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<400> 1510

Arg Leu Lys Glu Glu Glu Glu Asp Lys Lys
1 5 10

<210> 1511
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<400> 1511

Thr Lys Ala Ala Glu Lys Gln Met Lys Asp
1 5 10

<210> 1512
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<400> 1512

Ala His Gly Arg Ser Gln Val Leu Gln Gln Ser Thr Tyr Gln Leu Leu
1 5 10 15

Gln Glu Leu Cys Cys
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<210> 1513
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<400> 1513

Ala Gln Gly Ser Val Gln Pro Gln Gln Leu Pro Gln Phe Glu Glu Ile
1 5 10 15

Arg Asn Leu Ala Leu
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<210> 1514
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<400> 1514

Phe Cys Met Asp Val Val Leu Gln Gln His Asn Ile Ala His Gly Arg
1 5 10 15

Ser Gln Val Leu Gln
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<210> 1515
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<400> 1515

His Asn Ile Ala His Gly Arg Ser Gln Val Leu Gln Gln Ser Thr Tyr
1 5 10 15

Gln Leu

<210> 1516
<211> 21
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<213> Triticum aestivum

<400> 1516

Leu Cys Cys Gln His Leu Trp Gln Ile Pro Glu Gln Ser Gln Cys Gln
1 5 10 15

Ala Ile His Asn Val
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<210> 1517
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<400> 1517

Leu Pro Tyr Ser Gln Pro Gln Pro Phe Arg Pro Gln Gln Pro Tyr
1 5 10 15

<210> 1518
<211> 21
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<400> 1518

Leu Pro Tyr Ser Gln Pro Gln Pro Phe Arg Pro Gln Gln Pro Tyr Pro
1 5 10 15

Gln Pro Gln Pro Gln
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<210> 1519
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<400> 1519

Leu Gln Gln His Asn Ile Ala His Gly Arg Ser Gln Val Leu Gln Gln
1 5 10 15

Ser Thr Tyr Gln Leu
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<210> 1520
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<400> 1520

Leu Gln Gln Gln Leu Ile Phe Cys Met Asp Val Val Leu Gln Gln His
1 5 10 15

Asn Ile Ala His Gly
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<210> 1521
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<400> 1521

Met Lys Thr Phe Leu Ile Leu Ala Leu Leu Ala Ile Val Ala Thr Thr
1 5 10 15

Ala Thr Thr Ala Val
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<210> 1522
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<400> 1522

Pro Leu Val Gln Gln Gln Gln Phe Leu Gly Gln Gln Gln Pro Phe Pro
1 5 10 15

Pro Gln Gln Pro Tyr
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<210> 1523
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<400> 1523

Pro Pro Gln Gln Pro Tyr Pro Gln Pro Gln Pro Phe Pro Ser Gln Gln

1 5 10 15

Pro Tyr

<210> 1524
<211> 21
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<400> 1524

Pro Gln Gln Pro Ile Ser Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln
1 5 10 15

Gln Gln Gln Gln Gln
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<210> 1525
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<400> 1525

Gln Phe Leu Gly Gln Gln Gln Pro Phe Pro Pro Gln Gln Pro Tyr Pro
1 5 10 15

Gln Pro Gln Pro Phe
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<210> 1526
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<400> 1526

Gln Gly Ser Phe Arg Pro Ser Gln Gln Asn Pro Gln Ala Gln Gly Ser
1 5 10 15

Val Gln Pro Gln Gln
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<210> 1527
<211> 21
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<400> 1527

Gln Asn Pro Ser Gln Gln Gln Pro Gln Glu Gln Val Pro Leu Val Gln
1 5 10 15

Gln Gln Gln Phe Leu
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<210> 1528
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<400> 1528

Gln Pro Phe Pro Pro Gln Leu Pro Tyr Ser Gln Pro Gln Pro Phe Arg
1   5   10   15

Pro Gln Gln Pro Tyr
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<210> 1529
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<400> 1529

Gln Pro Phe Pro Pro Gln Gln Pro Tyr Pro Gln Pro Gln Pro Phe Pro
1   5   10   15

Ser Gln Gln Pro Tyr
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<400> 1530

Gln Pro Phe Pro Gln Pro Gln Leu Pro Tyr Pro
1   5   10

<210> 1531
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<400> 1531

Gln Pro Phe Pro Gln Pro Gln Leu Pro Tyr Ser Gln Pro Gln Pro Phe
1   5   10   15

Arg Pro Gln Gln Pro
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<210> 1532
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<400> 1532

Gln Pro Phe Pro Ser Gln Gln Pro Tyr Leu Gln Leu Gln Pro Phe Pro
1 5 10 15

Gln Pro Gln Leu Pro
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<210> 1533
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<400> 1533

Gln Pro Phe Arg Pro Gln Gln Pro Tyr Pro Gln Pro Gln Pro Gln Tyr
1 5 10 15

Ser Gln Pro Gln Gln
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<210> 1534
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<400> 1534

Gln Pro Gln Glu Gln Val Pro Leu Val Gln Gln Gln Gln Phe Leu Gly
1 5 10 15

Gln Gln Gln Pro Phe
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<210> 1535
<211> 21
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<400> 1535

Gln Pro Gln Tyr Ser Gln Pro Gln Gln Pro Ile Ser Gln Gln Gln Gln
1 5 10 15

Gln Gln Gln Gln Gln
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<210> 1536
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<400> 1536

Gln Pro Ser Ser Gln Val Ser Phe Gln Gln Pro Leu Gln Gln Tyr Pro
1 5 10 15

Leu Gly Gln Gly Ser
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<210> 1537
<211> 21
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<400> 1537

Gln Pro Tyr Leu Gln Leu Gln Pro Phe Pro Gln Pro Gln Leu Pro Tyr
1 5 10 15

Ser Gln Pro Gln Pro
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<210> 1538
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<400> 1538

Gln Pro Tyr Pro Gln Pro Gln Pro Phe Pro Ser Gln Gln Pro Tyr Leu
1 5 10 15

Gln Leu Gln Pro Phe
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<210> 1539
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<400> 1539

Gln Pro Tyr Pro Gln Pro Gln Pro Gln Tyr Ser Gln Pro Gln Gln Pro
1 5 10 15

Ile Ser Gln Gln Gln
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<210> 1540
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<400> 1540

Gln Gln Lys Gln Gln Gln Gln Pro Ser Ser Gln Val Ser Phe Gln Gln
1 5 10 15

Pro Leu Gln Gln Tyr
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<210> 1541
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<400> 1541

Gln Gln Gln Gln Phe Leu Gly Gln Gln Gln Pro Phe Pro Pro Gln Gln
1   5   10   15

Pro Tyr

<210> 1542
<211> 18
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<400> 1542

Gln Gln Gln Gln Pro Ser Ser Gln Val Ser Phe Gln Gln Pro Leu Gln
1   5   10   15

Gln Tyr

<210> 1543
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<400> 1543

Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Ile Leu Gln
1   5   10   15

Gln Ile Leu Gln Gln
            20

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<400> 1544

Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln
1   5   10   15

Gln Gln Gln Ile Leu

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Gln Gln Arg Pro Phe Ile Gln Pro Ser Leu
1 5 10

<210> 1546
<211> 21
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<400> 1546

Gln Gln Tyr Pro Leu Gly Gln Gly Ser Phe Arg Pro Ser Gln Gln Asn
1 5 10 15

Pro Gln Ala Gln Gly
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<210> 1547
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<400> 1547

Ser Phe Gln Gln Pro Leu Gln Gln Tyr Pro Leu Gly Gln Gly Ser Phe
1 5 10 15

Arg Pro Ser Gln Gln
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<210> 1548
<211> 21
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<400> 1548

Ser Gln Cys Gln Ala Ile His Asn Val Val His Ala Ile Ile Leu His
1 5 10 15

Gln Gln Gln Gln Gln
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<210> 1549
<211> 21
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<400> 1549

Ser Gln Gln Asn Pro Gln Ala Gln Gly Ser Val Gln Pro Gln Gln Leu
1 5 10 15

Pro Gln Phe Glu Glu
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<210> 1550
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<400> 1550

Thr Ala Val Arg Val Pro Val Pro Gln Leu Gln Pro Gln Asn Pro Ser
1 5 10 15

Gln Gln Gln Pro Gln
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<210> 1551
<211> 21
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<400> 1551

Val Leu Gln Gln Ser Thr Tyr Gln Leu Leu Gln Glu Leu Cys Cys Gln
1 5 10 15

His Leu Trp Gln Ile
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<210> 1552
<211> 21
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<400> 1552

Val Pro Gln Leu Gln Pro Gln Asn Pro Ser Gln Gln Gln Pro Gln Glu
1 5 10 15

Gln Val Pro Leu Val
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<210> 1553
<211> 21
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<400> 1553

Tyr Gln Leu Leu Gln Glu Leu Cys Cys Gln His Leu Trp Gln Ile Pro
1   5   10   15

Glu Gln Ser Gln Cys
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<400> 1554

Ala His Gly Arg Ser Gln Val Leu Gln Gln Ser Thr
1   5   10

<210> 1555
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<400> 1555

Ala Leu Gln Thr Leu Pro Ala Met Cys Asn Val Tyr
1   5   10

<210> 1556
<211> 12
<212> PRT
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<400> 1556

Ala Met Cys Asn Val Tyr Ile Pro Pro Tyr Cys Thr
1   5   10

<210> 1557
<211> 12
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<400> 1557

Glu Glu Ile Arg Asn Leu Ala Leu Gln Thr Leu Pro
1   5   10

<210> 1558
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<212> PRT
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<400> 1558

Phe Pro Pro Gln Gln Pro Tyr Pro Gln Pro Gln Pro
1   5   10

<210> 1559
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<400> 1559

Phe Pro Gln Pro Gln Leu Pro Tyr Ser Gln Pro Gln
1 5 10

<210> 1560
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<400> 1560

Phe Pro Ser Gln Gln Pro Tyr Leu Gln Leu Gln Pro
1 5 10

<210> 1561
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<400> 1561

Phe Gln Gln Pro Leu Gln Gln Tyr Pro Leu Gly Gln
1 5 10

<210> 1562
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<400> 1562

Gly Ser Phe Arg Pro Ser Gln Gln Asn Pro Gln Ala
1 5 10

<210> 1563
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<400> 1563

His Asn Val Val His Ala Ile Ile Leu His Gln Gln
1 5 10

<210> 1564
<211> 12
<212> PRT
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<400> 1564

Ile Ile Leu His Gln Gln Gln Lys Gln Gln Gln Gln

1 5 10

<210> 1565
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<400> 1565

Ile Pro Pro Tyr Cys Thr Ile Ala Pro Phe Gly Ile
1 5 10

<210> 1566
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<400> 1566

Leu Cys Cys Gln His Leu Trp Gln Ile Pro Glu Gln
1 5 10

<210> 1567
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<400> 1567

Leu Gln Gln His Asn Ile Ala His Gly Arg Ser Gln
1 5 10

<210> 1568
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<400> 1568

Leu Gln Gln Gln Leu Ile Pro Cys Met Asp Val Val
1 5 10

<210> 1569
<211> 12
<212> PRT
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<400> 1569

Pro Cys Met Asp Val Val Leu Gln Gln His Asn Ile
1 5 10

<210> 1570
<211> 12
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<400> 1570

Pro Phe Arg Pro Gln Gln Pro Tyr Pro Gln Pro Gln
1 5 10

<210> 1571
<211> 12
<212> PRT
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<400> 1571

Pro Gln Tyr Ser Gln Pro Gln Gln Pro Ile Ser Gln
1 5 10

<210> 1572
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<400> 1572

Pro Ser Gln Gln Gln Pro Gln Glu Gln Val Pro Leu
1 5 10

<210> 1573
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<212> PRT
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<400> 1573

Pro Ser Ser Gln Val Ser Phe Gln Gln Pro Leu Gln
1 5 10

<210> 1574
<211> 12
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<400> 1574

Pro Tyr Ser Gln Pro Gln Pro Phe Arg Pro Gln Gln
1 5 10

<210> 1575
<211> 12
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<400> 1575

Gln Glu Gln Val Pro Leu Val Gln Gln Gln Gln Phe
1 5 10

<210> 1576
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<212> PRT
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Gln Gly Ser Val Gln Pro Gln Gln Leu Pro Gln Phe
1 5 10

<210> 1577
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<400> 1577

Gln Ile Leu Gln Gln Ile Leu Gln Gln Gln Leu Ile
1 5 10

<210> 1578
<211> 12
<212> PRT
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<400> 1578

Gln Lys Gln Gln Gln Gln Pro Ser Ser Gln Val Ser
1 5 10

<210> 1579
<211> 12
<212> PRT
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<400> 1579

Gln Leu Gln Pro Gln Asn Pro Ser Gln Gln Gln Pro
1 5 10

<210> 1580
<211> 12
<212> PRT
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<400> 1580

Gln Gln Asn Pro Gln Ala Gln Gly Ser Val Gln Pro
1 5 10

<210> 1581
<211> 12
<212> PRT
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<400> 1581

Gln Gln Pro Ile Ser Gln Gln Ile Leu Gln Gln Ile
1 5 10

<210> 1582
<211> 12
<212> PRT
<213> Triticum aestivum

<400> 1582

Gln Tyr Pro Leu Gly Gln Gly Ser Phe Arg Pro Ser
1 5 10

<210> 1583
<211> 12
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<400> 1583

Ser Gln Cys Gln Ala Ile His Asn Val Val His Ala
1 5 10

<210> 1584
<211> 11
<212> PRT
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<400> 1584

Thr Ile Ala Pro Phe Gly Ile Phe Gly Thr Asn
1 5 10

<210> 1585
<211> 12
<212> PRT
<213> Triticum aestivum

<400> 1585

Val Leu Gln Gln Ser Thr Tyr Gln Leu Leu Gln Glu
1 5 10

<210> 1586
<211> 12
<212> PRT
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<400> 1586

Val Gln Gln Gln Gln Phe Leu Gly Gln Gln Gln Pro
1 5 10

<210> 1587
<211> 12
<212> PRT
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<400> 1587

Trp Gln Ile Pro Glu Gln Ser Gln Cys Gln Ala Ile
1 5 10

<210> 1588
<211> 12
<212> PRT
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<400> 1588

Tyr Leu Gln Leu Gln Pro Phe Pro Gln Pro Gln Leu
1 5 10

<210> 1589
<211> 12
<212> PRT
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<400> 1589

Tyr Pro Gln Pro Gln Pro Phe Pro Ser Gln Gln Pro
1 5 10

<210> 1590
<211> 12
<212> PRT
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<400> 1590

Tyr Gln Leu Leu Gln Glu Leu Cys Cys Gln His Leu
1 5 10

<210> 1591
<211> 15
<212> PRT
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<400> 1591

Gln Leu Gln Pro Phe Pro Gln Pro Gln Leu Pro Tyr Pro Gln Pro
1 5 10 15

<210> 1592
<211> 12
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<220>
<223> epitope involved in celiac disease

<400> 1592

Phe Pro Gln Gln Pro Glu Gln Pro Tyr Pro Gln Gln
1 5 10

<210> 1593

<211> 15
<212> PRT
<213> Triticum aestivum

<400> 1593

Gly Gln Gly Ile Ile Gln Pro Gln Gln Pro Ala Gln Leu Ile Arg
1 5 10 15

<210> 1594
<211> 33
<212> PRT
<213> Triticum aestivum

<400> 1594

Leu Gln Leu Gln Pro Phe Pro Gln Pro Gln Leu Pro Tyr Pro Gln Pro
1 5 10 15

Gln Leu Pro Tyr Pro Gln Pro Gln Leu Pro Tyr Pro Gln Pro Gln Pro
20 25 30

Phe

<210> 1595
<211> 9
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<400> 1595

Pro Phe Pro Gln Pro Gln Leu Pro Tyr
1 5

<210> 1596
<211> 15
<212> PRT
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<400> 1596

Pro Phe Pro Gln Gln Pro Gln Gln Pro Tyr Pro Gln Gln Pro Gln
1 5 10 15

<210> 1597
<211> 25
<212> PRT
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<400> 1597

Pro Gln Leu Pro Gln Phe Leu Gln Pro Gln Pro Tyr Pro Gln Pro Gln
1 5 10 15

Leu Pro Tyr Pro Gln Pro Gln Pro Phe

20 25

<210> 1598
<211> 9
<212> PRT
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<400> 1598

Pro Gln Pro Gln Leu Pro Gln Pro Gln
1 5

<210> 1599
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<400> 1599

Pro Gln Pro Gln Pro Phe Leu Pro Gln Leu Pro Tyr Pro Gln Pro Gln
1 5 10 15

Ser

<210> 1600
<211> 17
<212> PRT
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<400> 1600

Pro Gln Pro Gln Pro Phe Pro Pro Gln Leu Pro Tyr Pro Gln Pro Gln
1 5 10 15

Ser

<210> 1601
<211> 14
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<400> 1601

Pro Gln Gln Pro Phe Pro Ser Gln Gln Gln Gln Pro Leu Ile
1 5 10

<210> 1602
<211> 15
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<400> 1602

Pro Gln Gln Pro Gln Gln Ser Phe Pro Gln Gln Gln Gln Pro Ala

1 5 10 15

<210> 1603
<211> 14
<212> PRT
<213> Triticum aestivum

<400> 1603

Pro Gln Gln Gln Thr Leu Gln Pro Gln Gln Pro Ala Gln Leu
1 5 10

<210> 1604
<211> 15
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<400> 1604

Gln Ile Pro Gln Gln Gln Gln Ile Pro Gln Gln Pro Gln Gln Phe
1 5 10 15

<210> 1605
<211> 17
<212> PRT
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<400> 1605

Gln Leu Gln Pro Phe Pro Gln Pro Thr Leu Pro Tyr Pro Gln Pro Gln
1 5 10 15

Ser

<210> 1606
<211> 18
<212> PRT
<213> Triticum aestivum

<400> 1606

Gln Pro Gln Pro Tyr Pro Gln Pro Gln Leu Pro Tyr Pro Gln Pro Gln
1 5 10 15

Pro Phe

<210> 1607
<211> 17
<212> PRT
<213> Triticum aestivum

<400> 1607

Gln Pro Gln Gln Pro Phe Pro Gln Pro Gln Gln Pro Phe Pro Trp Gln

1 5 10 15

Pro

<210> 1608
<211> 15
<212> PRT
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<400> 1608

Gln Gln Phe Ser Gln Pro Gln Gln Gln Phe Pro Gln Pro Gln Gln
1 5 10 15

<210> 1609
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<220>
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<400> 1609

Gln Tyr Pro Ser Gly Glu Gly Ser Phe Gln Pro Ser Gln Glu Asn Pro
1 5 10 15

Gln Ala

<210> 1610
<211> 6
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<213> Triticum aestivum

<400> 1610

Gln Gln Gln Pro Phe Pro
1 5

<210> 1611
<211> 8
<212> PRT
<213> Homo sapiens

<400> 1611

Ala Ser Phe Glu Pro Phe Ser Asn
1 5

<210> 1612
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Asn Val Tyr Ile
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Pro Gln Pro Phe
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His Gly Arg Ser
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Phe Phe Gln Pro
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Ile Ile Leu His Gln Gln His His
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Pro Gln Gln Leu Pro Gln
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Gln Gly Phe Phe Gln Pro
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Gln Gly Ser Phe Gln Pro
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Gln Leu Gln Pro Phe Pro
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Gln Pro Gln Pro Phe Pro
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Arg Asp Val Val Leu Gln Gln His Asn Ile
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Arg Asn Leu Ala Leu Gln Thr Leu Pro Ala
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Ser Gln Gln Pro Tyr Leu Gln Leu Gln Pro
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Tyr Leu Gln Leu Gln Pro Phe Pro Gln Pro
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Cys Gln Gln Leu Trp Gln Ile Pro Glu Gln
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Phe Glu Glu Ile Arg Asn Leu Ala Leu Gln
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Gly Ser Phe Gln Pro Gln Gln Leu Pro Gln
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Leu Ser Gln Val Ser Phe Gln Gln Pro Gln
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Pro Leu Val Gln Glu Gln Gln Phe Gln Gly
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Pro Gln Phe Glu Glu Ile Arg Asn Leu Ala
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Pro Gln Gln Gln Tyr Pro Ser Gly Gln Gly
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Gln Glu Gln Val Pro Leu Val Gln Glu Gln
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Gln Glu Ser Thr Tyr Gln Leu Val Gln Gln
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Gln Gly Phe Phe Gln Pro Ser Gln Gln Asn
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Gln Leu Pro Gln Phe Glu Glu Ile Arg Asn
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Gln Leu Trp Gln Ile Pro Glu Gln Ser Arg
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Gln Pro Phe Pro Pro Gln Gln Pro Tyr Pro
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Gln Gln His His His His Gln Glu Gln Lys
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Gln Gln Gln Pro Leu Ser Gln Val Ser Phe
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Gln Val Pro Leu Val Gln Glu Gln Gln Phe
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Gln Gln Pro Phe Pro Gln Pro
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Tyr Pro Ser

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Glu Gly Ser Phe Gln Pro Ser Gln Glu
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Gln Gly Tyr Tyr Pro Thr Ser Pro Gln
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<210> 1725
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Val Arg Arg Gly Gln Pro Phe Trp Leu Thr Leu His Phe Glu Gly Arg
35 40 45

Asn Tyr Glu Ala Ser Val Asp Ser Leu Thr Phe Ser Val Val Thr Gly
50 55 60

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

Asp Ala Val Glu Glu Gly Asp Trp Thr Ala Thr Val Val Asp Gln Gln
85 90 95

Asp Cys Thr Leu Ser Leu Gln Leu Thr Thr Pro Ala Asn Ala Pro Ile
100 105 110

Gly Leu Tyr Arg Leu Ser Leu Glu Ala Ser Thr Gly Tyr Gln Gly Ser
115 120 125

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Ser Phe Val Leu Gly His Phe Ile Leu Leu Phe Asn Ala Trp Cys Pro
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Ala Asp Ala Val Tyr Leu Asp Ser Glu Glu Glu Arg Gln Glu Tyr Val
145                 150                 155                 160

Leu Thr Gln Gln Gly Phe Ile Tyr Gln Gly Ser Ala Lys Phe Ile Lys
                165                 170                 175

Asn Ile Pro Trp Asn Phe Gly Gln Phe Glu Asp Gly Ile Leu Asp Ile
            180                 185                 190

Cys Leu Ile Leu Leu Asp Val Asn Pro Lys Phe Leu Lys Asn Ala Gly
        195                 200                 205

Arg Asp Cys Ser Arg Arg Ser Ser Pro Val Tyr Val Gly Arg Val Val
    210                 215                 220

Ser Gly Met Val Asn Cys Asn Asp Asp Gln Gly Val Leu Leu Gly Arg
225                 230                 235                 240

Trp Asp Asn Asn Tyr Gly Asp Gly Val Ser Pro Met Ser Trp Ile Gly
                245                 250                 255

Ser Val Asp Ile Leu Arg Arg Trp Lys Asn His Gly Cys Gln Arg Val
            260                 265                 270

Lys Tyr Gly Gln Cys Trp Val Phe Ala Ala Val Ala Cys Thr Val Leu
        275                 280                 285

Arg Cys Leu Gly Ile Pro Thr Arg Val Val Thr Asn Tyr Asn Ser Ala
    290                 295                 300

His Asp Gln Asn Ser Asn Leu Leu Ile Glu Tyr Phe Arg Asn Glu Phe
305                 310                 315                 320

Gly Glu Ile Gln Gly Asp Lys Ser Glu Met Ile Trp Asn Phe His Cys
                325                 330                 335

Trp Val Glu Ser Trp Met Thr Arg Pro Asp Leu Gln Pro Gly Tyr Glu
            340                 345                 350

Gly Trp Gln Ala Leu Asp Pro Thr Pro Gln Glu Lys Ser Glu Gly Thr
        355                 360                 365

Tyr Cys Cys Gly Pro Val Pro Val Arg Ala Ile Lys Glu Gly Asp Leu
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370 375 380

Ser Thr Lys Tyr Asp Ala Pro Phe Val Phe Ala Glu Val Asn Ala Asp
385 390 395 400

Val Val Asp Trp Ile Gln Gln Asp Asp Gly Ser Val His Lys Ser Ile
405 410 415

Asn Arg Ser Leu Ile Val Gly Leu Lys Ile Ser Thr Lys Ser Val Gly
420 425 430

Arg Asp Glu Arg Glu Asp Ile Thr His Thr Tyr Lys Tyr Pro Glu Gly
435 440 445

Ser Ser Glu Glu Arg Glu Ala Phe Thr Arg Ala Asn His Leu Asn Lys
450 455 460

Leu Ala Glu Lys Glu Glu Thr Gly Met Ala Met Arg Ile Arg Val Gly
465 470 475 480

Gln Ser Met Asn Met Gly Ser Asp Phe Asp Val Phe Ala His Ile Thr
485 490 495

Asn Asn Thr Ala Glu Glu Tyr Val Cys Arg Leu Leu Leu Cys Ala Arg
500 505 510

Thr Val Ser Tyr Asn Gly Ile Leu Gly Pro Glu Cys Gly Thr Lys Tyr
515 520 525

Leu Leu Asn Leu Asn Leu Glu Pro Phe Ser Glu Lys Ser Val Pro Leu
530 535 540

Cys Ile Leu Tyr Glu Lys Tyr Arg Asp Cys Leu Thr Glu Ser Asn Leu
545 550 555 560

Ile Lys Val Arg Ala Leu Leu Val Glu Pro Val Ile Asn Ser Tyr Leu
565 570 575

Leu Ala Glu Arg Asp Leu Tyr Leu Glu Asn Pro Glu Ile Lys Ile Arg
580 585 590

Ile Leu Gly Glu Pro Lys Gln Lys Arg Lys Leu Val Ala Glu Val Ser
595 600 605

Leu Gln Asn Pro Leu Pro Val Ala Leu Glu Gly Cys Thr Phe Thr Val
610 615 620

```
Glu Gly Ala Gly Leu Thr Glu Glu Gln Lys Thr Val Glu Ile Pro Asp
625                 630                 635                 640


Pro Val Glu Ala Gly Glu Glu Val Lys Val Arg Met Asp Leu Leu Pro
                645                 650                 655


Leu His Met Gly Leu His Lys Leu Val Val Asn Phe Glu Ser Asp Lys
            660                 665                 670


Leu Lys Ala Val Lys Gly Phe Arg Asn Val Ile Ile Gly Pro Ala
        675                 680                 685


<210>  1726
<211>  15
<212>  PRT
<213>  Unknown

<220>
<223>  epitope involved in celiac disease

<400>  1726

Phe Pro Glu Gln Pro Gln Gln Pro Tyr Pro Gln Gln Pro Gln Gln
1               5                   10                  15


<210>  1727
<211>  14
<212>  PRT
<213>  Unknown

<220>
<223>  epitope involved in celiac disease

<400>  1727

Pro Gln Thr Glu Gln Pro Gln Gln Pro Phe Pro Gln Pro Gln
1               5                   10


<210>  1728
<211>  13
<212>  PRT
<213>  Unknown

<220>
<223>  epitope involved in celiac disease

<400>  1728

Gln Glu Gly Tyr Tyr Pro Thr Ser Pro Glu Gln Ser Gly
1               5                   10


<210>  1729
<211>  13
<212>  PRT
<213>  Unknown
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<220>
<223> epitope involved in celiac disease

<400> 1729

Gln Glu Gly Tyr Tyr Pro Thr Ser Pro Gln Gln Ser Gly
1   5   10

<210> 1730
<211> 13
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1730

Gln Gln Gly Tyr Tyr Pro Thr Ser Pro Glu Gln Ser Gly
1   5   10

<210> 1731
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1731

Ser Gly Glu Gly Ser Phe Gln Pro Ser Gln Gln Asn Pro Gln
1   5   10

<210> 1732
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1732

Gln Leu Gln Pro Phe Ser Gln Pro Gln Leu Pro Tyr
1   5   10

<210> 1733
<211> 15
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1733

Gln Gln Pro Pro Phe Ala Glu Gln Glu Gln Pro Val Leu Pro Gln
1   5   10   15

<210> 1734
<211> 15
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1734

Gln Gln Pro Pro Phe Gly Glu Gln Glu Gln Pro Val Leu Pro Gln
1 5 10 15

<210> 1735
<211> 15
<212> PRT
<213> Triticum aestivum

<400> 1735

Gln Gln Pro Pro Phe Ser Gln Gln Gln Gln Pro Val Leu Pro Gln
1 5 10 15

<210> 1736
<211> 15
<212> PRT
<213> Triticum aestivum

<400> 1736

Gln Gln Pro Pro Phe Ser Gln Gln Gln Gln Gln Pro Leu Pro Gln
1 5 10 15

<210> 1737
<211> 20
<212> PRT
<213> Triticum aestivum

<400> 1737

Gln Gln Gln Gln Pro Pro Phe Ser Gln Gln Gln Gln Ser Pro Phe Ser
1 5 10 15

Gln Gln Gln Gln
20

<210> 1738
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1738

Ala Gln Pro Glu Gln Pro Glu Gln Pro Phe Pro Gln Pro Gln
1   5   10

<210> 1739
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1739

Lys Gln Pro Glu Gln Pro Glu Gln Pro Phe Pro Gln Pro Gln
1   5   10

<210> 1740
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1740

Pro Ala Pro Glu Gln Pro Glu Gln Pro Phe Pro Gln Pro Gln
1   5   10

<210> 1741
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1741

Pro Lys Pro Glu Gln Pro Glu Gln Pro Phe Pro Gln Pro Gln
1   5   10

<210> 1742
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1742

Pro Gln Ala Glu Gln Pro Glu Gln Pro Phe Pro Gln Pro Gln
1   5   10

<210> 1743
<211> 14
<212> PRT

<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1743

Pro Gln Lys Glu Gln Pro Glu Gln Pro Phe Pro Gln Pro Gln
1 5 10

<210> 1744
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1744

Pro Gln Pro Ala Gln Pro Glu Gln Pro Phe Pro Gln Pro Gln
1 5 10

<210> 1745
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1745

Pro Gln Pro Glu Ala Pro Glu Gln Pro Phe Pro Gln Pro Gln
1 5 10

<210> 1746
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1746

Pro Gln Pro Glu Gln Ala Glu Gln Pro Phe Pro Gln Pro Gln
1 5 10

<210> 1747
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1747

Pro Gln Pro Glu Gln Pro Ala Gln Pro Phe Pro Gln Pro Gln
1   5   10

<210> 1748
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1748

Pro Gln Pro Glu Gln Pro Glu Ala Pro Phe Pro Gln Pro Gln
1   5   10

<210> 1749
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1749

Pro Gln Pro Glu Gln Pro Glu Gln Ala Phe Pro Gln Pro Gln
1   5   10

<210> 1750
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1750

Pro Gln Pro Glu Gln Pro Glu Gln Pro Ala Pro Gln Pro Gln
1   5   10

<210> 1751
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1751

Pro Gln Pro Glu Gln Pro Glu Gln Pro Phe Ala Gln Pro Gln
1   5   10

<210> 1752
<211> 14
<212> PRT

<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1752

Pro Gln Pro Glu Gln Pro Glu Gln Pro Phe Pro Ala Pro Gln
1 5 10

<210> 1753
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1753

Pro Gln Pro Glu Gln Pro Glu Gln Pro Phe Pro Lys Pro Gln
1 5 10

<210> 1754
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1754

Pro Gln Pro Glu Gln Pro Glu Gln Pro Phe Pro Gln Ala Gln
1 5 10

<210> 1755
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1755

Pro Gln Pro Glu Gln Pro Glu Gln Pro Phe Pro Gln Lys Gln
1 5 10

<210> 1756
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1756

Pro Gln Pro Glu Gln Pro Glu Gln Pro Phe Pro Gln Pro Ala
1   5   10

<210> 1757
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1757

Pro Gln Pro Glu Gln Pro Glu Gln Pro Phe Pro Gln Pro Lys
1   5   10

<210> 1758
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1758

Pro Gln Pro Glu Gln Pro Glu Gln Pro Phe Pro Gln Pro Gln
1   5   10

<210> 1759
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1759

Pro Gln Pro Glu Gln Pro Gln Gln Pro Phe Pro Gln Pro Gln
1   5   10

<210> 1760
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in celiac disease

<400> 1760

Pro Gln Pro Gln Gln Pro Glu Gln Pro Phe Pro Gln Pro Gln
1   5   10

<210> 1761
<211> 17
<212> PRT

<213> Triticum aestivum

<400> 1761

Gln Pro Gln Gln Pro Gln Gln Pro Phe Pro Gln Gln Gln Gln Pro Leu
1 5 10 15

Ile

<210> 1762
<211> 17
<212> PRT
<213> Triticum aestivum

<400> 1762

Gln Pro Gln Gln Pro Gln Gln Ser Phe Pro Gln Gln Gln Gln Leu Met
1 5 10 15

Ile

<210> 1763
<211> 17
<212> PRT
<213> Triticum aestivum

<400> 1763

Gln Pro Gln Gln Pro Gln Gln Ser Phe Pro Gln Gln Gln Gln Pro Ala
1 5 10 15

Ile

<210> 1764
<211> 17
<212> PRT
<213> Triticum aestivum

<400> 1764

Gln Pro Gln Gln Pro Gln Gln Ser Phe Pro Gln Gln Gln Gln Pro Leu
1 5 10 15

Ile

<210> 1765
<211> 18
<212> PRT
<213> Triticum aestivum

<400> 1765

Gln Gln Tyr Pro Ser Gly Gln Gly Ser Phe Gln Pro Ser Gln Gln Asn
1 5 10 15

Pro Gln

<210> 1766
<211> 13
<212> PRT
<213> Triticum aestivum

<400> 1766

Ser Gly Gln Gly Ser Phe Gln Pro Ser Gln Gln Asn Pro
1 5 10

<210> 1767
<211> 15
<212> PRT
<213> Homo sapiens

<400> 1767

Cys Asp Gly Glu Arg Pro Thr Leu Ala Phe Leu Gln Asp Val Met
1 5 10 15

<210> 1768
<211> 9
<212> PRT
<213> Influenza A virus

<400> 1768

Cys Thr Glu Leu Lys Leu Ser Asp Tyr
1 5

<210> 1769
<211> 10
<212> PRT
<213> Homo sapiens

<400> 1769

Asp Gly Val Ala Val Leu Lys Val Gly Gly
1 5 10

<210> 1770
<211> 17
<212> PRT
<213> Human coxsackievirus

<400> 1770

Glu Ala Ile Pro Ala Leu Thr Ala Val Glu Thr Gly His Thr Ser Gln
1 5 10 15

Val

<210> 1771
<211> 17
<212> PRT
<213> Mycobacterium tuberculosis

<400> 1771

Glu Gly Asp Glu Ala Thr Gly Ala Asn Ile Val Lys Val Ala Leu Glu
1 5 10 15

Ala

<210> 1772
<211> 9
<212> PRT
<213> Influenza A virus

<400> 1772

Glu Leu Arg Ser Arg Tyr Trp Ala Ile
1 5

<210> 1773
<211> 15
<212> PRT
<213> Homo sapiens

<400> 1773

Phe Val Asn Gln His Leu Cys Gly Ser His Leu Val Glu Ala Leu
1 5 10 15

<210> 1774
<211> 20
<212> PRT
<213> Coxsackievirus B4

<400> 1774

Gly Ala His Glu Thr Ser Leu Ser Ala Ser Gly Asn Ser Ile Ile His
1 5 10 15

Tyr Thr Asn Ile
20

<210> 1775
<211> 10
<212> PRT
<213> Homo sapiens

<400> 1775

Gly Cys Ala Leu Leu Arg Cys Ile Pro Ala
1 5 10

<210> 1776
<211> 10
<212> PRT
<213> Mycobacterium bovis

<400> 1776

Gly Gly Val Ala Val Ile Lys Ala Gly Ala
1 5 10

<210> 1777
<211> 9
<212> PRT
<213> Influenza A virus

<400> 1777

Gly Ile Leu Gly Phe Val Phe Thr Leu
1 5

<210> 1778
<211> 20
<212> PRT
<213> Coxsackievirus B4

<400> 1778

Gly Asn Ser Ile Ile His Tyr Thr Asn Ile Asn Tyr Tyr Lys Asp Ala
1 5 10 15

Ala Ser Asn Ser
20

<210> 1779
<211> 10
<212> PRT
<213> Mycobacterium bovis

<400> 1779

Gly Val Thr Leu Leu Gln Ala Ala Pro Thr
1 5 10

<210> 1780
<211> 13
<212> PRT
<213> Homo sapiens

<400> 1780

Ile Ala Phe Thr Ser Glu His Ser His Phe Ser Leu Lys
1 5 10

<210> 1781
<211> 9
<212> PRT
<213> Influenza A virus

<400> 1781

Ile Leu Arg Gly Ser Val Ala His Lys
1 5

<210> 1782
<211> 10
<212> PRT
<213> Mycobacterium bovis

<400> 1782

Ile Val Ala Gly Gly Gly Val Thr Leu Leu
1 5 10

<210> 1783
<211> 10
<212> PRT
<213> Homo sapiens

<400> 1783

Ile Val Leu Gly Gly Gly Cys Ala Leu Leu
1 5 10

<210> 1784
<211> 9
<212> PRT
<213> Influenza A virus

<400> 1784

Ile Tyr Ser Thr Val Ala Ser Ser Leu
1 5

<210> 1785
<211> 9
<212> PRT
<213> Lymphocytic choriomeningitis virus

<400> 1785

Lys Ala Val Tyr Asn Phe Ala Thr Cys
1 5

<210> 1786
<211> 14
<212> PRT
<213> Human poliovirus

<400> 1786

Lys Glu Val Pro Ala Leu Thr Ala Val Glu Thr Gly Ala Thr
1   5   10

<210> 1787
<211> 12
<212> PRT
<213> Coxsackievirus B4

<400> 1787

Lys Ile Leu Pro Glu Val Lys Glu Lys His Glu Phe
1   5   10

<210> 1788
<211> 10
<212> PRT
<213> Mycobacterium bovis

<400> 1788

Leu Ala Lys Leu Ala Gly Gly Val Ala Val
1   5   10

<210> 1789
<211> 10
<212> PRT
<213> Homo sapiens

<400> 1789

Leu Ala Lys Leu Ser Asp Gly Val Ala Val
1   5   10

<210> 1790
<211> 20
<212> PRT
<213> Mus musculus

<400> 1790

Leu Val Leu Asn Arg Leu Lys Val Gly Leu Gln Val Val Ala Val Lys
1   5   10   15

Ala Pro Gly Phe
            20

<210> 1791
<211> 20
<212> PRT
<213> Coxsackievirus B4

<400> 1791

Met Gly Ala Gln Val Ser Thr Gln Lys Thr Gly Ala His Glu Thr Ser
1   5   10   15

Leu Ser Ala Ser
20

<210> 1792
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1792

Asn Met Tyr Ala Met Met Ile Ala Arg Phe Lys Met Phe Pro Glu Val
1 5 10 15

Lys Glu Lys Gly
20

<210> 1793
<211> 30
<212> PRT
<213> Coxsackievirus B4

<400> 1793

Asn Tyr Tyr Lys Asp Ala Ala Ser Asn Ser Ala Asn Arg Gln Asp Phe
1 5 10 15

Thr Gln Asp Pro Ser Lys Phe Thr Glu Pro Val Lys Asp Val
20 25 30

<210> 1794
<211> 13
<212> PRT
<213> Influenza A virus

<400> 1794

Pro Lys Tyr Val Lys Gln Asn Thr Leu Lys Leu Ala Thr
1 5 10

<210> 1795
<211> 15
<212> PRT
<213> Mycobacterium sp.

<400> 1795

Pro Tyr Ile Leu Leu Val Ser Ser Lys Val Ser Thr Val Lys Asp
1 5 10 15

<210> 1796
<211> 14
<212> PRT
<213> Clostridium tetani

<400> 1796

Gln Tyr Ile Lys Ala Asn Ser Lys Phe Ile Gly Ile Thr Glu
1 5 10

<210> 1797
<211> 11
<212> PRT
<213> Influenza A virus

<400> 1797

Ser Phe Glu Arg Phe Glu Ile Phe Pro Lys Glu
1 5 10

<210> 1798
<211> 15
<212> PRT
<213> Mus musculus

<400> 1798

Ser His Leu Val Glu Ala Leu Tyr Leu Val Cys Gly Glu Arg Gly
1 5 10 15

<210> 1799
<211> 8
<212> PRT
<213> Gallus gallus

<400> 1799

Ser Ile Ile Asn Phe Glu Lys Leu
1 5

<210> 1800
<211> 19
<212> PRT
<213> Coxsackievirus B4

<400> 1800

Ser Lys Phe Thr Glu Pro Val Lys Asp Val Met Ile Lys Ser Leu Pro
1 5 10 15

Ala Leu Asn

<210> 1801
<211> 15
<212> PRT
<213> Mus musculus

<400> 1801

Thr Tyr Glu Ile Ala Pro Val Phe Val Leu Leu Glu Tyr Val Thr
1 5 10 15

<210> 1802
<211> 24
<212> PRT
<213> Mycobacterium bovis

<400> 1802

Val Ala Gly Gly Gly Val Thr Leu Leu Gln Ala Ala Pro Thr Leu Asp
1 5 10 15

Glu Leu Lys Leu Glu Gly Asp Glu
20

<210> 1803
<211> 24
<212> PRT
<213> Homo sapiens

<400> 1803

Val Leu Gly Gly Gly Val Ala Leu Leu Arg Val Ile Pro Ala Leu Asp
1 5 10 15

Ser Leu Thr Pro Ala Asn Glu Asp
20

<210> 1804
<211> 20
<212> PRT
<213> Rubella virus

<400> 1804

Ala Phe Gly His Ser Asp Ala Ala Cys Trp Gly Phe Pro Thr Asp Thr
1 5 10 15

Val Met Ser Val
20

<210> 1805
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1805

Glu Ile Ile Lys Arg Thr Leu Lys Ile Pro Ala Met Thr Ile Ala Lys
1 5 10 15

Asn Ala Gly Val
20

<210> 1806
<211> 20
<212> PRT

<213> Homo sapiens

<400> 1806

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

Gly Asp Lys Ala
20

<210> 1807
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1807

Ile Val Leu Gly Gly Gly Cys Ala Leu Leu Arg Cys Ile Pro Ala Leu
1 5 10 15

Asp Ser Leu Thr
20

<210> 1808
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1808

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

Leu Ala Asp Ala
20

<210> 1809
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1809

Leu Val Ile Ile Ala Glu Asp Val Asp Gly Glu Ala Leu Ser Thr Leu
1 5 10 15

Val Leu Asn Arg
20

<210> 1810
<211> 21
<212> PRT
<213> Rubella virus

<400> 1810

Pro Thr Asp Val Ser Cys Glu Gly Leu Gly Ala Trp Val Pro Thr Ala
1 5 10 15

Pro Cys Ala Arg Ile
20

<210> 1811
<211> 9
<212> PRT
<213> Homo sapiens

<400> 1811

Val Met Ala Pro Arg Thr Val Leu Leu
1 5

<210> 1812
<211> 19
<212> PRT
<213> Homo sapiens

<400> 1812

Pro Gly Ser Gly Phe Trp Ser Phe Gly Ser Glu Asp Gly Ser Gly Asp
1 5 10 15

Ser Glu Asn

<210> 1813
<211> 9
<212> PRT
<213> Homo sapiens

<400> 1813

Ala Leu Trp Met Arg Leu Leu Pro Leu
1 5

<210> 1814
<211> 9
<212> PRT
<213> Homo sapiens

<400> 1814

Phe Leu Phe Ala Val Gly Phe Tyr Leu
1 5

<210> 1815
<211> 9
<212> PRT
<213> Homo sapiens

<400> 1815

Phe Leu Ile Val Leu Ser Val Ala Leu
1 5

<210> 1816
<211> 9
<212> PRT
<213> Homo sapiens

<400> 1816

Phe Leu Trp Ser Val Phe Met Leu Ile
1 5

<210> 1817
<211> 26
<212> PRT
<213> Homo sapiens

<400> 1817

Phe Trp Tyr Ile Pro Pro Ser Leu Arg Thr Leu Glu Asp Asn Glu Glu
1 5 10 15

Arg Met Ser Arg Leu Ser Lys Val Ala Pro
20 25

<210> 1818
<211> 13
<212> PRT
<213> Homo sapiens

<400> 1818

Gly Ala His Gly Asp Thr Thr Pro Glu Tyr Gln Asp Leu
1 5 10

<210> 1819
<211> 10
<212> PRT
<213> Homo sapiens

<400> 1819

Gly Ile Val Glu Gln Cys Cys Thr Ser Ile
1 5 10

<210> 1820
<211> 9
<212> PRT
<213> Homo sapiens

<400> 1820

His Leu Val Glu Ala Leu Tyr Leu Val
1 5

<210> 1821
<211> 34
<212> PRT
<213> Homo sapiens

<400> 1821

His Thr Asn Val Cys Phe Trp Tyr Ile Pro Pro Ser Leu Arg Thr Leu
1 5 10 15

Glu Asp Asn Glu Glu Arg Met Ser Arg Leu Ser Lys Val Ala Pro Val
20 25 30

Ile Lys

<210> 1822
<211> 13
<212> PRT
<213> Homo sapiens

<400> 1822

Lys Glu Arg Leu Ala Ala Leu Gly Pro Glu Gly Ala His
1 5 10

<210> 1823
<211> 23
<212> PRT
<213> Homo sapiens

<400> 1823

Lys Glu Arg Leu Ala Ala Leu Gly Pro Glu Gly Ala His Gly Asp Thr
1 5 10 15

Thr Pro Glu Tyr Gln Asp Leu
20

<210> 1824
<211> 9
<212> PRT
<213> Homo sapiens

<400> 1824

Lys Leu Gln Val Phe Leu Ile Val Leu
1 5

<210> 1825
<211> 9
<212> PRT
<213> Homo sapiens

<400> 1825

Leu Leu Pro Pro Leu Leu Glu His Leu
1 5

<210> 1826
<211> 6
<212> PRT
<213> Homo sapiens

<400> 1826

Met Ala Ser Pro Gly Ser
1 5

<210> 1827
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1827

Met Ala Ser Pro Gly Ser Gly Phe Trp Ser Phe Gly Ser Glu Asp Gly
1 5 10 15

Ser Gly Asp Ser
20

<210> 1828
<211> 13
<212> PRT
<213> Homo sapiens

<400> 1828

Asn Phe Phe Arg Met Val Ile Ser Asn Pro Ala Ala Thr
1 5 10

<210> 1829
<211> 13
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 1829

Asn Phe Ile Arg Met Val Ile Ser Asn Pro Ala Ala Thr
1 5 10

<210> 1830
<211> 13
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 1830

Gln Pro Leu Ala Leu Glu Gly Ser Leu Gln Ser Arg Gly
1 5 10

<210> 1831
<211> 9
<212> PRT
<213> Homo sapiens

<400> 1831

Arg Leu Leu Cys Ala Leu Thr Ser Leu
1 5

<210> 1832
<211> 15
<212> PRT
<213> Homo sapiens

<400> 1832

Arg Thr Leu Glu Asp Asn Glu Glu Arg Met Ser Arg Leu Ser Lys
1 5 10 15

<210> 1833
<211> 9
<212> PRT
<213> Homo sapiens

<400> 1833

Ser Leu Ala Ala Gly Val Lys Leu Leu
1 5

<210> 1834
<211> 10
<212> PRT
<213> Homo sapiens

<400> 1834

Ser Leu Gln Lys Arg Gly Ile Val Glu Gln
1 5 10

<210> 1835
<211> 9
<212> PRT
<213> Homo sapiens

<400> 1835

Ser Leu Gln Pro Leu Ala Leu Glu Gly
1 5

<210> 1836

<211> 15
<212> PRT
<213> Homo sapiens

<400> 1836

Ser Leu Gln Pro Leu Ala Leu Glu Gly Ser Leu Gln Lys Arg Gly
1 5 10 15

<210> 1837
<211> 15
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 1837

Ser Leu Gln Pro Leu Ala Leu Glu Gly Ser Leu Gln Ser Arg Gly
1 5 10 15

<210> 1838
<211> 9
<212> PRT
<213> Homo sapiens

<400> 1838

Ser Leu Ser Pro Leu Gln Ala Glu Leu
1 5

<210> 1839
<211> 9
<212> PRT
<213> Homo sapiens

<400> 1839

Ser Leu Tyr Gln Leu Glu Asn Tyr Cys
1 5

<210> 1840
<211> 3
<212> PRT
<213> Homo sapiens

<400> 1840

Thr Ser Ile
1

<210> 1841
<211> 585
<212> PRT
<213> Homo sapiens

<400> 1841

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Met Ala Ser Pro Gly Ser Gly Phe Trp Ser Phe Gly Ser Glu Asp Gly
1               5                  10                  15

Ser Gly Asp Ser Glu Asn Pro Gly Thr Ala Arg Ala Trp Cys Gln Val
            20                  25                  30

Ala Gln Lys Phe Thr Gly Gly Ile Gly Asn Lys Leu Cys Ala Leu Leu
        35                  40                  45

Tyr Gly Asp Ala Glu Lys Pro Ala Glu Ser Gly Gly Ser Gln Pro Pro
    50                  55                  60

Arg Ala Ala Ala Arg Lys Ala Ala Cys Ala Cys Asp Gln Lys Pro Cys
65                  70                  75                  80

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

Leu Leu Pro Ala Cys Asp Gly Glu Arg Pro Thr Leu Ala Phe Leu Gln
            100                 105                 110

Asp Val Met Asn Ile Leu Leu Gln Tyr Val Val Lys Ser Phe Asp Arg
        115                 120                 125

Ser Thr Lys Val Ile Asp Phe His Tyr Pro Asn Glu Leu Leu Gln Glu
    130                 135                 140

Tyr Asn Trp Glu Leu Ala Asp Gln Pro Gln Asn Leu Glu Glu Ile Leu
145                 150                 155                 160

Met His Cys Gln Thr Thr Leu Lys Tyr Ala Ile Lys Thr Gly His Pro
                165                 170                 175

Arg Tyr Phe Asn Gln Leu Ser Thr Gly Leu Asp Met Val Gly Leu Ala
            180                 185                 190

Ala Asp Trp Leu Thr Ser Thr Ala Asn Thr Asn Met Phe Thr Tyr Glu
        195                 200                 205

Ile Ala Pro Val Phe Val Leu Leu Glu Tyr Val Thr Leu Lys Lys Met
    210                 215                 220

Arg Glu Ile Ile Gly Trp Pro Gly Gly Ser Gly Asp Gly Ile Phe Ser
225                 230                 235                 240

Pro Gly Gly Ala Ile Ser Asn Met Tyr Ala Met Met Ile Ala Arg Phe
                245                 250                 255
```

```
Lys Met Phe Pro Glu Val Lys Glu Lys Gly Met Ala Ala Leu Pro Arg
            260                 265                 270

Leu Ile Ala Phe Thr Ser Glu His Ser His Phe Ser Leu Lys Lys Gly
        275                 280                 285

Ala Ala Ala Leu Gly Ile Gly Thr Asp Ser Val Ile Leu Ile Lys Cys
    290                 295                 300

Asp Glu Arg Gly Lys Met Ile Pro Ser Asp Leu Glu Arg Arg Ile Leu
305                 310                 315                 320

Glu Ala Lys Gln Lys Gly Phe Val Pro Phe Leu Val Ser Ala Thr Ala
                325                 330                 335

Gly Thr Thr Val Tyr Gly Ala Phe Asp Pro Leu Leu Ala Val Ala Asp
            340                 345                 350

Ile Cys Lys Lys Tyr Lys Ile Trp Met His Val Asp Ala Ala Trp Gly
        355                 360                 365

Gly Gly Leu Leu Met Ser Arg Lys His Lys Trp Lys Leu Ser Gly Val
    370                 375                 380

Glu Arg Ala Asn Ser Val Thr Trp Asn Pro His Lys Met Met Gly Val
385                 390                 395                 400

Pro Leu Gln Cys Ser Ala Leu Leu Val Arg Glu Glu Gly Leu Met Gln
                405                 410                 415

Asn Cys Asn Gln Met His Ala Ser Tyr Leu Phe Gln Gln Asp Lys His
            420                 425                 430

Tyr Asp Leu Ser Tyr Asp Thr Gly Asp Lys Ala Leu Gln Cys Gly Arg
        435                 440                 445

His Val Asp Val Phe Lys Leu Trp Leu Met Trp Arg Ala Lys Gly Thr
    450                 455                 460

Thr Gly Phe Glu Ala His Val Asp Lys Cys Leu Glu Leu Ala Glu Tyr
465                 470                 475                 480

Leu Tyr Asn Ile Ile Lys Asn Arg Glu Gly Tyr Glu Met Val Phe Asp
                485                 490                 495

Gly Lys Pro Gln His Thr Asn Val Cys Phe Trp Tyr Ile Pro Pro Ser
```

500 505 510

Leu Arg Thr Leu Glu Asp Asn Glu Glu Arg Met Ser Arg Leu Ser Lys
515 520 525

Val Ala Pro Val Ile Lys Ala Arg Met Met Glu Tyr Gly Thr Thr Met
530 535 540

Val Ser Tyr Gln Pro Leu Gly Asp Lys Val Asn Phe Phe Arg Met Val
545 550 555 560

Ile Ser Asn Pro Ala Ala Thr His Gln Asp Ile Asp Phe Leu Ile Glu
565 570 575

Glu Ile Glu Arg Leu Gly Gln Asp Leu
580 585

<210> 1842
<211> 14
<212> PRT
<213> Homo sapiens

<400> 1842

Ala Phe Ile Glu Phe Lys Ala Asp Glu Lys Lys Glu Asp Glu
1 5 10

<210> 1843
<211> 15
<212> PRT
<213> Homo sapiens

<400> 1843

Cys Phe Trp Tyr Ile Pro Pro Ser Leu Arg Thr Leu Glu Asp Asn
1 5 10 15

<210> 1844
<211> 15
<212> PRT
<213> Homo sapiens

<400> 1844

Glu Arg Met Ser Arg Leu Ser Lys Val Ala Pro Val Ile Lys Ala
1 5 10 15

<210> 1845
<211> 18
<212> PRT
<213> Bos taurus

<400> 1845

```
Phe Lys Ala Asp Glu Lys Lys Phe Trp Gly Lys Tyr Leu Tyr Glu Ile
1               5                   10                  15


Ala Arg



<210>  1846
<211>  33
<212>  PRT
<213>  Homo sapiens

<400>  1846

Asn Met Tyr Ala Met Met Ile Ala Arg Phe Lys Met Phe Pro Glu Val
1               5                   10                  15


Lys Glu Lys Gly Met Ala Ala Leu Pro Arg Leu Ile Ala Phe Thr Ser
            20                  25                  30


Glu



<210>  1847
<211>  20
<212>  PRT
<213>  Homo sapiens

<400>  1847

Ser Arg Leu Ser Lys Val Ala Pro Val Ile Lys Ala Arg Met Met Glu
1               5                   10                  15


Tyr Gly Thr Thr
            20


<210>  1848
<211>  41
<212>  PRT
<213>  Homo sapiens

<400>  1848

Val Ser Tyr Gln Pro Leu Gly Asp Lys Val Asn Phe Phe Arg Met Val
1               5                   10                  15


Ile Ser Asn Pro Ala Ala Thr His Gln Asp Ile Asp Phe Leu Ile Glu
            20                  25                  30


Glu Ile Glu Arg Leu Gly Gln Asp Leu
        35                  40


<210>  1849
<211>  20
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<212> PRT
<213> Homo sapiens

<400> 1849

Ala Glu Asp Glu Val Gln Arg Glu Arg Val Ser Ala Lys Asn Ala Leu
1 5 10 15

Glu Ser Tyr Ala
20

<210> 1850
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1850

Ala Glu Lys Asp Glu Phe Glu His Lys Arg Lys Glu Leu Glu Gln Val
1 5 10 15

Cys Asn Pro Ile
20

<210> 1851
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1851

Ala Gly Gly Val Met Thr Ala Leu Ile Lys Arg Asn Ser Thr Ile Pro
1 5 10 15

Thr Lys Gln Thr
20

<210> 1852
<211> 10
<212> PRT
<213> Homo sapiens

<400> 1852

Ala Lys Ser Lys Asn His Thr Thr His Asn
1 5 10

<210> 1853
<211> 9
<212> PRT
<213> Homo sapiens

<400> 1853

Ala Leu Thr Ala Val Ala Glu Glu Val
1 5

<210> 1854
<211> 12
<212> PRT
<213> Homo sapiens

<400> 1854

Ala Gln Val Ala Thr Ile Ser Ala Asn Gly Asp Lys
1 5 10

<210> 1855
<211> 12
<212> PRT
<213> Homo sapiens

<400> 1855

Ala Val Ala Asp Ile Cys Lys Lys Tyr Lys Ile Trp
1 5 10

<210> 1856
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1856

Asp Gly Val Thr Val Ala Lys Ser Ile Asp Leu Lys Asp Lys Tyr Lys
1 5 10 15

Asn Ile Gly Ala
20

<210> 1857
<211> 31
<212> PRT
<213> Homo sapiens

<400> 1857

Asp Lys Val Asn Phe Phe Arg Met Val Ile Ser Asn Pro Ala Ala Thr
1 5 10 15

His Gln Asp Ile Asp Phe Leu Ile Glu Glu Ile Glu Arg Leu Gly
20 25 30

<210> 1858
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1858

Asp Thr Glu Arg Leu Ile Gly Asp Ala Ala Lys Asn Gln Val Ala Leu
1 5 10 15

Asn Pro Gln Asn
20

<210> 1859
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1859

Glu Asp Leu Gln Val Gly Gln Val Glu Leu Gly Gly Gly Pro Gly Ala
1 5 10 15

<210> 1860
<211> 20
<212> PRT
<213> Mus musculus

<400> 1860

Glu Glu Ile Ala Gln Val Ala Thr Ile Ser Ala Asn Gly Asp Lys Asp
1 5 10 15

Ile Gly Asn Ile
20

<210> 1861
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1861

Glu Glu Ile Ala Gln Val Ala Thr Ile Ser Ala Asn Gly Asp Lys Glu
1 5 10 15

Ile Gly Asn Ile
20

<210> 1862
<211> 9
<212> PRT
<213> Homo sapiens

<400> 1862

Phe Leu Gln Asp Val Met Asn Ile Leu
1 5

<210> 1863
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1863

Phe Tyr Thr Pro Lys Thr Arg Arg Glu Ala Glu Asp Leu Gln Val Gly
1 5 10 15

<210> 1864
<211> 18
<212> PRT
<213> Homo sapiens

<400> 1864

Gly Ala Gly Ser Leu Gln Pro Leu Ala Leu Glu Gly Ser Leu Gln Lys
1 5 10 15

Arg Gly

<210> 1865
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1865

Gly Leu Asn Val Leu Arg Ile Ile Asn Glu Pro Thr Ala Ala Ala Ile
1 5 10 15

Ala Tyr Gly Leu
20

<210> 1866
<211> 10
<212> PRT
<213> Homo sapiens

<400> 1866

Gly Ser Gly Pro Thr Ile Glu Glu Val Asp
1 5 10

<210> 1867
<211> 10
<212> PRT
<213> Homo sapiens

<400> 1867

His Leu Cys Gly Ser His Leu Val Glu Ala
1 5 10

<210> 1868
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1868

His Leu Val Glu Ala Leu Tyr Leu Val Cys Gly Glu Arg Gly Phe Phe
1 5 10 15

<210> 1869
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1869

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

Ile Phe Asp Leu
20

<210> 1870
<211> 15
<212> PRT
<213> Homo sapiens

<400> 1870

Ile Asp Phe Leu Ile Glu Glu Ile Glu Arg Leu Gly Gln Asp Leu
1 5 10 15

<210> 1871
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1871

Ile Pro Pro Ser Leu Arg Thr Leu Glu Asp Asn Glu Glu Arg Met Ser
1 5 10 15

Arg Leu Ser Lys
20

<210> 1872
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1872

Lys Ala Asn Lys Ile Thr Ile Thr Asn Asp Lys Gly Arg Leu Ser Lys
1 5 10 15

Glu Glu Ile Glu
20

<210> 1873

<211> 20
<212> PRT
<213> Homo sapiens

<400> 1873

Lys Ala Pro Gly Phe Gly Asp Asn Arg Lys Asn Gln Leu Lys Asp Met
1 5 10 15

Ala Ile Ala Thr
20

<210> 1874
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1874

Lys Glu Glu Ile Glu Arg Met Val Gln Glu Ala Glu Lys Tyr Lys Ala
1 5 10 15

Glu Asp Glu Val
20

<210> 1875
<211> 15
<212> PRT
<213> Homo sapiens

<400> 1875

Lys Lys Gly Ala Ala Ala Leu Gly Ile Gly Thr Asp Ser Val Ile
1 5 10 15

<210> 1876
<211> 12
<212> PRT
<213> Homo sapiens

<400> 1876

Lys Lys Tyr Lys Ile Trp Met His Val Asp Ala Ala
1 5 10

<210> 1877
<211> 12
<212> PRT
<213> Homo sapiens

<400> 1877

Lys Leu Cys Ala Leu Leu Tyr Gly Asp Ala Glu Lys
1 5 10

<210> 1878

<211> 20
<212> PRT
<213> Homo sapiens

<400> 1878

Lys Arg Thr Leu Ser Ser Ser Thr Gln Ala Ser Leu Glu Ile Asp Ser
1 5 10 15

Leu Phe Glu Gly
20

<210> 1879
<211> 18
<212> PRT
<213> Homo sapiens

<400> 1879

Lys Val Asn Phe Phe Arg Met Val Ile Ser Asn Pro Ala Ala Thr His
1 5 10 15

Gln Asp

<210> 1880
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1880

Leu Glu Ser Tyr Ala Phe Asn Met Lys Ser Ala Val Glu Asp Glu Gly
1 5 10 15

Leu Lys Gly Lys
20

<210> 1881
<211> 15
<212> PRT
<213> Homo sapiens

<400> 1881

Leu Lys Lys Met Arg Glu Ile Ile Gly Trp Pro Gly Gly Ser Gly
1 5 10 15

<210> 1882
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1882

Leu Leu Ala Asp Ala Val Ala Val Thr Met Gly Pro Lys Gly Arg Thr

1 5 10 15

Val Ile Ile Glu
20

<210> 1883
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1883

Leu Leu Leu Leu Asp Val Ala Pro Leu Ser Leu Gly Leu Glu Thr Ala
1 5 10 15

Gly Gly Val Met
20

<210> 1884
<211> 9
<212> PRT
<213> Homo sapiens

<400> 1884

Leu Leu Gln Glu Tyr Asn Trp Glu Leu
1 5

<210> 1885
<211> 9
<212> PRT
<213> Mus musculus

<400> 1885

Leu Tyr Leu Val Cys Gly Glu Arg Gly
1 5

<210> 1886
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1886

Met Ala Lys Ala Ala Ala Val Gly Ile Asp Leu Gly Thr Thr Tyr Ser
1 5 10 15

Cys Val Gly Val
20

<210> 1887
<211> 12
<212> PRT
<213> Homo sapiens

<400> 1887

Met Ala Ser Pro Gly Ser Gly Phe Trp Ser Phe Gly
1 5 10

<210> 1888
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1888

Met Leu Arg Leu Pro Thr Val Phe Arg Gln Met Arg Pro Val Ser Arg
1 5 10 15

Val Leu Ala Pro
20

<210> 1889
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1889

Asn Asp Gln Gly Asn Arg Thr Thr Pro Ser Tyr Val Ala Phe Thr Asp
1 5 10 15

Thr Glu Arg Leu
20

<210> 1890
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1890

Asn Glu Glu Ala Gly Asp Gly Thr Thr Thr Ala Thr Val Leu Ala Arg
1 5 10 15

Ser Ile Ala Lys
20

<210> 1891
<211> 14
<212> PRT
<213> Homo sapiens

<400> 1891

Asn Ile Leu Leu Gln Tyr Val Val Lys Ser Phe Asp Arg Ser
1 5 10

<210> 1892
<211> 13
<212> PRT
<213> Homo sapiens

<400> 1892

Asn Pro Ala Ala Thr His Gln Asp Ile Asp Phe Leu Ile
1 5 10

<210> 1893
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1893

Asn Pro Val Glu Ile Arg Arg Gly Val Met Leu Ala Val Asp Ala Val
1 5 10 15

Ile Ala Glu Leu
20

<210> 1894
<211> 12
<212> PRT
<213> Homo sapiens

<400> 1894

Pro Ala Glu Ser Gly Gly Ser Gln Pro Pro Arg Ala
1 5 10

<210> 1895
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1895

Pro Ala Pro Gly Val Pro Gln Ile Glu Val Thr Phe Asp Ile Asp Ala
1 5 10 15

Asn Gly Ile Leu
20

<210> 1896
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1896

Pro Phe Gln Val Ile Asn Asp Gly Asp Lys Pro Lys Val Gln Val Ser
1 5 10 15

Tyr Lys Gly Glu
20

<210> 1897
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1897

Pro Gly Pro Gly Gly Phe Gly Ala Gln Gly Pro Lys Gly Gly Ser Gly
1 5 10 15

Ser Gly Pro Thr
20

<210> 1898
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1898

Pro Thr Lys Gln Thr Gln Ile Phe Thr Thr Tyr Ser Asp Asn Gln Pro
1 5 10 15

Gly Val Leu Ile
20

<210> 1899
<211> 13
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 1899

Pro Val Gln Leu Ser Asn Gln Trp His Val Val Gly Ala
1 5 10

<210> 1900
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1900

Gln Asp Ala Tyr Val Leu Leu Ser Glu Lys Lys Ile Ser Ser Ile Gln
1 5 10 15

Ser Ile Val Pro
20

<210> 1901
<211> 21
<212> PRT
<213> Homo sapiens

<400> 1901

Gln Ser Ile Val Pro Ala Leu Glu Ile Ala Asn Ala His Arg Lys Pro
1 5 10 15

Leu Val Ile Ile Ala
20

<210> 1902
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1902

Arg Phe Glu Glu Leu Cys Ser Asp Leu Phe Arg Ser Thr Leu Glu Pro
1 5 10 15

Val Glu Lys Ala
20

<210> 1903
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1903

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

Leu Glu Ile Ile
20

<210> 1904
<211> 10
<212> PRT
<213> Homo sapiens

<400> 1904

Arg Met Met Glu Tyr Gly Thr Thr Met Val
1 5 10

<210> 1905
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1905

Arg Ser Ile Ala Lys Glu Gly Phe Glu Lys Ile Ser Lys Gly Ala Asn
1 5 10 15

Pro Val Glu Ile
20

<210> 1906
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1906

Arg Val Leu Ala Pro His Leu Thr Arg Ala Tyr Ala Lys Asp Val Lys
1 5 10 15

Phe Gly Ala Asp
20

<210> 1907
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1907

Ser Cys Val Gly Val Phe Gln His Gly Lys Val Glu Ile Ile Ala Asn
1 5 10 15

Asp Gln Gly Asn
20

<210> 1908
<211> 10
<212> PRT
<213> Homo sapiens

<400> 1908

Ser Leu Tyr His Val Tyr Glu Val Asn Leu
1 5 10

<210> 1909
<211> 12
<212> PRT
<213> Homo sapiens

<400> 1909

Thr Ala Arg Ala Trp Cys Gln Val Ala Gln Lys Phe
1 5 10

<210> 1910
<211> 20
<212> PRT

<213> Homo sapiens

<400> 1910

Thr His Leu Gly Gly Glu Asp Phe Asp Asn Arg Leu Val Asn His Phe
1 5 10 15

Val Glu Glu Phe
20

<210> 1911
<211> 9
<212> PRT
<213> Homo sapiens

<400> 1911

Thr Ile Ala Asp Phe Trp Gln Met Val
1 5

<210> 1912
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1912

Thr Ile Asp Asp Gly Ile Phe Glu Val Lys Ala Thr Ala Gly Asp Thr
1 5 10 15

His Leu Gly Gly
20

<210> 1913
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1913

Thr Val Ile Ile Glu Gln Ser Trp Gly Ser Pro Lys Val Thr Lys Asp
1 5 10 15

Gly Val Thr Val
20

<210> 1914
<211> 10
<212> PRT
<213> Homo sapiens

<400> 1914

Val Cys Gly Glu Arg Gly Phe Phe Tyr Thr
1 5 10

<210> 1915
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1915

Val Cys Asn Pro Ile Ile Ser Gly Leu Tyr Gln Gly Ala Gly Gly Pro
1 5 10 15

Gly Pro Gly Gly
20

<210> 1916
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1916

Val Asp Lys Cys Leu Glu Leu Ala Glu Tyr Leu Tyr Asn Ile Ile Lys
1 5 10 15

Asn Arg Glu Gly
20

<210> 1917
<211> 13
<212> PRT
<213> Homo sapiens

<400> 1917

Val Glu Gln Cys Cys Thr Ser Ile Cys Ser Leu Tyr Gln
1 5 10

<210> 1918
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1918

Val Ile Ala Glu Leu Lys Lys Gln Ser Lys Pro Val Thr Thr Pro Glu
1 5 10 15

Glu Ile Ala Gln
20

<210> 1919
<211> 9
<212> PRT
<213> Homo sapiens

<400> 1919

Val Ile Val Met Leu Thr Pro Leu Val
1 5

<210> 1920
<211> 24
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 1920

Val Leu Gly Gly Gly Val Leu Leu Leu Arg Val Ile Pro Ala Leu Asp
1 5 10 15

Ser Leu Thr Pro Ala Asn Glu Asp
20

<210> 1921
<211> 10
<212> PRT
<213> Homo sapiens

<400> 1921

Val Met Asn Ile Leu Leu Gln Tyr Val Val
1 5 10

<210> 1922
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1922

Val Asn Met Val Glu Lys Gly Ile Ile Asp Pro Thr Lys Val Val Arg
1 5 10 15

Thr Ala Leu Leu
20

<210> 1923
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1923

Val Gln Lys Leu Leu Gln Asp Phe Phe Asn Gly Arg Asp Leu Asn Lys
1 5 10 15

Ser Ile Asn Pro
20

<210> 1924
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1924

Val Thr Asp Ala Leu Asn Ala Thr Arg Ala Ala Val Glu Glu Gly Ile
1 5 10 15

Val Leu Gly Gly
20

<210> 1925
<211> 9
<212> PRT
<213> Mus musculus

<400> 1925

Val Tyr Leu Lys Thr Asn Val Phe Leu
1 5

<210> 1926
<211> 13
<212> PRT
<213> Homo sapiens

<400> 1926

Ala Lys Gly Thr Thr Gly Phe Glu Ala His Val Asp Lys
1 5 10

<210> 1927
<211> 10
<212> PRT
<213> Homo sapiens

<400> 1927

Ala Leu Trp Gly Pro Asp Pro Ala Ala Ala
1 5 10

<210> 1928
<211> 15
<212> PRT
<213> Homo sapiens

<400> 1928

Phe Asp Arg Ser Thr Lys Val Ile Asp Phe His Tyr Pro Asn Glu
1 5 10 15

<210> 1929
<211> 20
<212> PRT

<213> Homo sapiens

<400> 1929

Phe Phe Arg Met Val Ile Ser Asn Pro Ala Ala Thr His Gln Asp Ile
1 5 10 15

Asp Phe Leu Ile
20

<210> 1930
<211> 13
<212> PRT
<213> Homo sapiens

<400> 1930

Phe Phe Tyr Thr Pro Lys Thr Arg Arg Glu Ala Glu Asp
1 5 10

<210> 1931
<211> 17
<212> PRT
<213> Homo sapiens

<400> 1931

Phe Tyr Thr Pro Lys Thr Arg Arg Glu Ala Glu Asp Leu Gln Val Gly
1 5 10 15

Gln

<210> 1932
<211> 17
<212> PRT
<213> Homo sapiens

<400> 1932

Gly Gly Pro Gly Ala Gly Ser Leu Gln Pro Leu Ala Leu Glu Gly Ser
1 5 10 15

Leu

<210> 1933
<211> 12
<212> PRT
<213> Homo sapiens

<400> 1933

Gly His Pro Arg Tyr Phe Asn Gln Leu Ser Thr Gly
1 5 10

<210> 1934
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1934

Ile Pro Pro Ser Leu Arg Tyr Leu Glu Asp Asn Glu Glu Arg Met Ser
1 5 10 15

Arg Leu Ser Lys
20

<210> 1935
<211> 20
<212> PRT
<213> Mus musculus

<400> 1935

Lys Gly Asp Lys Ala His Ile Glu Lys Arg Ile Gln Glu Ile Thr Glu
1 5 10 15

Gln Leu Asp Ile
20

<210> 1936
<211> 15
<212> PRT
<213> Homo sapiens

<400> 1936

Lys His Tyr Asp Leu Ser Tyr Asp Thr Gly Asp Lys Ala Leu Gln
1 5 10 15

<210> 1937
<211> 15
<212> PRT
<213> Homo sapiens

<400> 1937

Lys Arg Gly Ile Val Glu Gln Cys Cys Thr Ser Ile Cys Ser Leu
1 5 10 15

<210> 1938
<211> 9
<212> PRT
<213> Homo sapiens

<400> 1938

Leu Ala Leu Glu Gly Ser Leu Gln Lys
1 5

<210> 1939
<211> 17
<212> PRT
<213> Homo sapiens

<400> 1939

Leu Ala Leu Trp Gly Pro Asp Pro Ala Ala Ala Phe Val Asn Gln His
1 5 10 15

Leu

<210> 1940
<211> 17
<212> PRT
<213> Homo sapiens

<400> 1940

Leu Leu Pro Leu Leu Ala Leu Leu Ala Leu Trp Gly Pro Asp Pro Ala
1 5 10 15

Ala

<210> 1941
<211> 9
<212> PRT
<213> Homo sapiens

<400> 1941

Leu Asn Ile Asp Leu Leu Trp Ser Val
1 5

<210> 1942
<211> 14
<212> PRT
<213> Homo sapiens

<400> 1942

Leu Pro Arg Leu Ile Ala Phe Thr Ser Glu His Ser His Phe
1 5 10

<210> 1943
<211> 15
<212> PRT
<213> Homo sapiens

<400> 1943

Leu Pro Arg Leu Ile Ala Phe Thr Ser Glu His Ser His Phe Ser
1 5 10 15

<210> 1944
<211> 17
<212> PRT
<213> Homo sapiens

<400> 1944

Leu Val Glu Ala Leu Tyr Leu Val Cys Gly Glu Arg Gly Phe Phe Tyr
1 5 10 15

Thr

<210> 1945
<211> 10
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 1945

Leu Trp Glu Ile Glu Phe Ala Lys Gln Leu
1 5 10

<210> 1946
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1946

Met Ala Leu Trp Met Arg Leu Leu Pro Leu Leu Ala Leu Leu Ala Leu
1 5 10 15

<210> 1947
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1947

Asn Trp Glu Leu Ala Asp Gln Pro Gln Asn Leu Glu Glu Ile Leu Met
1 5 10 15

His Cys Gln Thr
20

<210> 1948
<211> 17
<212> PRT
<213> Homo sapiens

<400> 1948

Pro Ala Ala Ala Phe Val Asn Gln His Leu Cys Gly Ser His Leu Val
1 5 10 15

Glu

<210> 1949
<211> 14
<212> PRT
<213> Homo sapiens

<400> 1949

Pro Gly Ser Gly Phe Trp Ser Phe Gly Ser Glu Asp Gly Ser
1 5 10

<210> 1950
<211> 17
<212> PRT
<213> Homo sapiens

<400> 1950

Gln His Leu Cys Gly Ser His Leu Val Glu Ala Leu Tyr Leu Val Cys
1 5 10 15

Gly

<210> 1951
<211> 17
<212> PRT
<213> Homo sapiens

<400> 1951

Arg Glu Ala Glu Asp Leu Gln Val Gly Gln Val Glu Leu Gly Gly Gly
1 5 10 15

Pro

<210> 1952
<211> 12
<212> PRT
<213> Homo sapiens

<400> 1952

Arg Leu Ile Ala Phe Thr Ser Glu His Ser His Phe
1 5 10

<210> 1953
<211> 9
<212> PRT

<213> Homo sapiens

<400> 1953

Arg Leu Leu Pro Leu Leu Ala Leu Leu
1 5

<210> 1954
<211> 15
<212> PRT
<213> Homo sapiens

<400> 1954

Arg Met Met Glu Tyr Gly Thr Thr Met Val Ser Tyr Gln Pro Leu
1 5 10 15

<210> 1955
<211> 20
<212> PRT
<213> Mus musculus

<400> 1955

Arg Thr Ala Leu Leu Asp Ala Ala Gly Val Ala Ser Leu Leu Thr Thr
1 5 10 15

Ala Glu Ala Val
20

<210> 1956
<211> 20
<212> PRT
<213> Mus musculus

<400> 1956

Thr Ala Glu Ala Val Val Thr Glu Ile Pro Lys Glu Glu Lys Asp Pro
1 5 10 15

Gly Met Gly Ala
20

<210> 1957
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1957

Thr Tyr Glu Ile Ala Pro Val Phe Val Leu Leu Phe Tyr Val Thr Leu
1 5 10 15

Lys Lys Met Arg
20

<210> 1958
<211> 17
<212> PRT
<213> Homo sapiens

<400> 1958

Val Cys Gly Glu Arg Gly Phe Phe Tyr Thr Pro Lys Thr Arg Arg Glu
1 5 10 15

Ala

<210> 1959
<211> 17
<212> PRT
<213> Homo sapiens

<400> 1959

Val Gly Gln Val Glu Leu Gly Gly Gly Pro Gly Ala Gly Ser Leu Gln
1 5 10 15

Pro

<210> 1960
<211> 9
<212> PRT
<213> Homo sapiens

<400> 1960

Val Leu Phe Gly Leu Gly Phe Ala Ile
1 5

<210> 1961
<211> 24
<212> PRT
<213> Homo sapiens

<400> 1961

Val Leu Gly Gly Gly Cys Ala Leu Leu Arg Cys Ile Pro Ala Leu Asp
1 5 10 15

Ser Leu Thr Pro Ala Asn Glu Asp
20

<210> 1962
<211> 8
<212> PRT
<213> Homo sapiens

<400> 1962

Trp Gly Pro Asp Pro Ala Ala Ala
1 5

<210> 1963
<211> 582
<212> PRT
<213> Homo sapiens

<400> 1963

Pro Gly Ser Gly Phe Trp Ser Phe Gly Ser Glu Asp Gly Ser Gly Asp
1 5 10 15

Ser Glu Asn Pro Gly Thr Ala Arg Ala Trp Cys Gln Val Ala Gln Lys
20 25 30

Phe Thr Gly Gly Ile Gly Asn Lys Leu Cys Ala Leu Leu Tyr Gly Asp
35 40 45

Ala Glu Lys Pro Ala Glu Ser Gly Gly Ser Gln Pro Pro Arg Ala Ala
50 55 60

Ala Arg Lys Ala Ala Cys Ala Cys Asp Gln Lys Pro Cys Ser Cys Ser
65 70 75 80

Lys Val Asp Val Asn Tyr Ala Phe Leu His Ala Thr Asp Leu Leu Pro
85 90 95

Ala Cys Asp Gly Glu Arg Pro Thr Leu Ala Phe Leu Gln Asp Val Met
100 105 110

Asn Ile Leu Leu Gln Tyr Val Val Lys Ser Phe Asp Arg Ser Thr Lys
115 120 125

Val Ile Asp Phe His Tyr Pro Asn Glu Leu Leu Gln Glu Tyr Asn Trp
130 135 140

Glu Leu Ala Asp Gln Pro Gln Asn Leu Glu Glu Ile Leu Met His Cys
145 150 155 160

Gln Thr Thr Leu Lys Tyr Ala Ile Lys Thr Gly His Pro Arg Tyr Phe
165 170 175

Asn Gln Leu Ser Thr Gly Leu Asp Met Val Gly Leu Ala Ala Asp Trp
180 185 190

Leu Thr Ser Thr Ala Asn Thr Asn Met Phe Thr Tyr Glu Ile Ala Pro
195 200 205

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Val Phe Val Leu Leu Glu Tyr Val Thr Leu Lys Lys Met Arg Glu Ile
    210                 215                 220

Ile Gly Trp Pro Gly Gly Ser Gly Asp Gly Ile Phe Ser Pro Gly Gly
225                 230                 235                 240

Ala Ile Ser Asn Met Tyr Ala Met Met Ile Ala Arg Phe Lys Met Phe
                245                 250                 255

Pro Glu Val Lys Glu Lys Gly Met Ala Ala Leu Pro Arg Leu Ile Ala
            260                 265                 270

Phe Thr Ser Glu His Ser His Phe Ser Leu Lys Lys Gly Ala Ala Ala
        275                 280                 285

Leu Gly Ile Gly Thr Asp Ser Val Ile Leu Ile Lys Cys Asp Glu Arg
    290                 295                 300

Gly Lys Met Ile Pro Ser Asp Leu Glu Arg Arg Ile Leu Glu Ala Lys
305                 310                 315                 320

Gln Lys Gly Phe Val Pro Phe Leu Val Ser Ala Thr Ala Gly Thr Thr
                325                 330                 335

Val Tyr Gly Ala Phe Asp Pro Leu Leu Ala Val Ala Asp Ile Cys Lys
            340                 345                 350

Lys Tyr Lys Ile Trp Met His Val Asp Ala Ala Trp Gly Gly Gly Leu
        355                 360                 365

Leu Met Ser Arg Lys His Lys Trp Lys Leu Ser Gly Val Glu Arg Ala
    370                 375                 380

Asn Ser Val Thr Trp Asn Pro His Lys Met Met Gly Val Pro Leu Gln
385                 390                 395                 400

Cys Ser Ala Leu Leu Val Arg Glu Glu Gly Leu Met Gln Asn Cys Asn
                405                 410                 415

Gln Met His Ala Ser Tyr Leu Phe Gln Gln Asp Lys His Tyr Asp Leu
            420                 425                 430

Ser Tyr Asp Thr Gly Asp Lys Ala Leu Gln Cys Gly Arg His Val Asp
        435                 440                 445

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


Ile Ile Lys Asn Arg Glu Gly Tyr Glu Met Val Phe Asp Gly Lys Pro
                485                 490                 495


Gln His Thr Asn Val Cys Phe Trp Tyr Ile Pro Pro Ser Leu Arg Thr
            500                 505                 510


Leu Glu Asp Asn Glu Glu Arg Met Ser Arg Leu Ser Lys Val Ala Pro
        515                 520                 525


Val Ile Lys Ala Arg Met Met Glu Tyr Gly Thr Thr Met Val Ser Tyr
    530                 535                 540


Gln Pro Leu Gly Asp Lys Val Asn Phe Phe Arg Met Val Ile Ser Asn
545                 550                 555                 560


Pro Ala Ala Thr His Gln Asp Ile Asp Phe Leu Ile Glu Glu Ile Glu
                565                 570                 575


Arg Leu Gly Gln Asp Leu
            580


<210>  1964
<211>  11
<212>  PRT
<213>  Homo sapiens

<400>  1964

Ala Phe Thr Ser Glu His Ser His Phe Ser Leu
1               5                   10


<210>  1965
<211>  12
<212>  PRT
<213>  Homo sapiens

<400>  1965

Ala Phe Thr Ser Glu His Ser His Phe Ser Leu Lys
1               5                   10


<210>  1966
<211>  17
<212>  PRT
<213>  Homo sapiens

<400>  1966
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Ala Gly Ser Leu Gln Pro Leu Ala Leu Glu Gly Ser Leu Gln Lys Arg
1 5 10 15

Gly

<210> 1967
<211> 9
<212> PRT
<213> Homo sapiens

<400> 1967

Ala Leu Tyr Leu Val Cys Gly Glu Arg
1 5

<210> 1968
<211> 18
<212> PRT
<213> Homo sapiens

<400> 1968

Ala Asn Thr Asn Met Phe Thr Tyr Glu Ile Ala Pro Val Phe Val Leu
1 5 10 15

Leu Glu

<210> 1969
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1969

Ala Thr His Gln Asp Ile Asp Phe Leu Ile Glu Glu Ile Glu Arg Leu
1 5 10 15

Gly Gln Asp Leu
20

<210> 1970
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 1970

Ala Tyr Asn Lys Ala Asn Trp Phe Leu
1 5

<210> 1971
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1971

Cys Cys Thr Ser Ile Cys Ser Leu Tyr Gln Leu Glu Asn Tyr Cys Asn
1 5 10 15

<210> 1972
<211> 11
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 1972

Cys His Ala Val Lys Val Gly Asn Pro Ser Cys
1 5 10

<210> 1973
<211> 11
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 1973

Cys Pro Arg Asp Leu Asn Gly Lys Ser Gly Cys
1 5 10

<210> 1974
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1974

Glu Ala Lys Gln Lys Gly Phe Val Pro Phe Leu Val Ser Ala Thr Ala
1 5 10 15

Gly Thr Thr Val
20

<210> 1975
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1975

Glu Arg Met Ser Arg Leu Ser Lys Val Ala Pro Val Ile Lys Ala Arg
1 5 10 15

Met Met Glu Tyr
            20

<210> 1976
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1976

Glu Val Lys Glu Lys Gly Met Ala Ala Leu Pro Arg Leu Ile Ala Phe
1   5   10   15

Thr Ser Glu His
            20

<210> 1977
<211> 11
<212> PRT
<213> Homo sapiens

<400> 1977

Phe Lys Met Phe Pro Glu Val Lys Glu Lys Gly
1   5   10

<210> 1978
<211> 10
<212> PRT
<213> Homo sapiens

<400> 1978

Phe Thr Ser Glu His Ser His Phe Ser Leu
1   5   10

<210> 1979
<211> 17
<212> PRT
<213> Homo sapiens

<400> 1979

Phe Val Asn Gln His Leu Cys Gly Ser His Leu Val Glu Ala Leu Tyr
1   5   10   15

Leu

<210> 1980
<211> 13
<212> PRT
<213> Homo sapiens

<400> 1980

Phe Trp Tyr Ile Pro Pro Ser Leu Arg Thr Leu Glu Asp
1 5 10

<210> 1981
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1981

Gly Asp Lys Val Asn Phe Phe Arg Met Val Ile Ser Asn Pro Ala Ala
1 5 10 15

Thr His Gln Asp
20

<210> 1982
<211> 17
<212> PRT
<213> Homo sapiens

<400> 1982

Gly Glu Arg Gly Phe Phe Tyr Thr Pro Lys Thr Arg Arg Glu Ala Glu
1 5 10 15

Asp

<210> 1983
<211> 21
<212> PRT
<213> Homo sapiens

<400> 1983

Gly Gly Gly Leu Leu Met Ser Arg Lys His Lys Trp Lys Leu Ser Gly
1 5 10 15

Val Glu Arg Ala Asn
20

<210> 1984
<211> 15
<212> PRT
<213> Homo sapiens

<400> 1984

Gly Ile Val Glu Gln Cys Cys Thr Ser Ile Cys Ser Leu Tyr Gln
1 5 10 15

<210> 1985

<211> 19
<212> PRT
<213> Homo sapiens

<400> 1985

Gly Leu Met Gln Asn Cys Asn Gln Met His Ala Ser Tyr Leu Phe Gln
1 5 10 15

Gln Asp Lys

<210> 1986
<211> 17
<212> PRT
<213> Homo sapiens

<400> 1986

Gly Gln Val Glu Leu Gly Gly Gly Pro Gly Ala Gly Ser Leu Gln Pro
1 5 10 15

Leu

<210> 1987
<211> 15
<212> PRT
<213> Homo sapiens

<400> 1987

Gly Ser His Leu Val Glu Ala Leu Tyr Leu Val Cys Gly Glu Arg
1 5 10 15

<210> 1988
<211> 17
<212> PRT
<213> Homo sapiens

<400> 1988

Gly Ser Leu Gln Lys Arg Gly Ile Val Glu Gln Cys Cys Thr Ser Ile
1 5 10 15

Cys

<210> 1989
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1989

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

1 5 10 15

Phe Arg Met Val
20

<210> 1990
<211> 15
<212> PRT
<213> Homo sapiens

<400> 1990

His Leu Cys Gly Ser His Leu Val Glu Ala Leu Tyr Leu Val Cys
1 5 10 15

<210> 1991
<211> 15
<212> PRT
<213> Homo sapiens

<400> 1991

His Leu Val Glu Ala Leu Tyr Leu Val Cys Gly Glu Arg Gly Phe
1 5 10 15

<210> 1992
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1992

His Thr Asn Val Cys Phe Trp Tyr Ile Pro Pro Ser Leu Arg Thr Leu
1 5 10 15

Glu Asp Asn Glu
20

<210> 1993
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 1993

Ile Met Glu Gln Cys Phe Glu Ile Gly Cys Pro Ala Thr Asn
1 5 10

<210> 1994
<211> 16
<212> PRT
<213> Homo sapiens

<400> 1994

Ile Pro Pro Ser Leu Arg Thr Leu Glu Asp Asn Glu Glu Arg Met Ser
1 5 10 15

<210> 1995
<211> 20
<212> PRT
<213> Homo sapiens

<400> 1995

Ile Ser Asn Pro Ala Ala Thr His Gln Asp Ile Asp Phe Leu Ile Glu
1 5 10 15

Glu Ile Glu Arg
20

<210> 1996
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 1996

Lys Tyr Asn Lys Ala Ala Trp Phe Leu
1 5

<210> 1997
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 1997

Lys Tyr Asn Lys Ala Asn Ala Phe Leu
1 5

<210> 1998
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 1998

Lys Tyr Asn Lys Ala Asn Trp Ala Leu
1 5

<210> 1999
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 1999

Lys Tyr Asn Lys Ala Asn Trp Phe Leu
1 5

<210> 2000
<211> 17
<212> PRT
<213> Homo sapiens

<400> 2000

Leu Cys Gly Ser His Leu Val Glu Ala Leu Tyr Leu Val Cys Gly Glu
1 5 10 15

Arg

<210> 2001
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2001

Leu Met Glu Pro Cys Tyr Ala Trp Gly Cys Thr Gly Pro Lys
1 5 10

<210> 2002
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2002

Leu Val Glu Ala Leu Tyr Leu Val Cys Gly Glu Arg Gly Phe Phe
1 5 10 15

<210> 2003
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2003

Leu Tyr Leu Val Cys Gly Glu Arg Gly Phe Phe Tyr Thr Pro Lys
1 5 10 15

<210> 2004
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2004

Met Ile Ala Arg Phe Lys Met Phe Pro Glu Val Lys Glu Lys Gly
1 5 10 15

<210> 2005
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2005

Met Met Ile Ala Arg Phe Lys Met Phe Pro Glu Val Lys Glu Lys Gly
1 5 10 15

Met Ala Ala Leu
20

<210> 2006
<211> 10
<212> PRT
<213> Homo sapiens

<400> 2006

Met Tyr Ala Met Met Ile Ala Arg Phe Lys
1 5 10

<210> 2007
<211> 12
<212> PRT
<213> Homo sapiens

<400> 2007

Met Tyr Ala Met Met Ile Ala Arg Phe Lys Met Phe
1 5 10

<210> 2008
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2008

Asn Asp Ser Gln Cys Trp Lys Leu Gly Cys Ile Ala Glu Lys
1 5 10

<210> 2009
<211> 12
<212> PRT
<213> Homo sapiens

<400> 2009

Asn Ile Leu Leu Gln Tyr Val Val Lys Ser Phe Asp
1 5 10

<210> 2010
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2010

Asn Pro Glu Asp Cys Phe Lys Thr Gly Cys Asn Ser Pro Thr
1 5 10

<210> 2011
<211> 12
<212> PRT
<213> Homo sapiens

<400> 2011

Asn Tyr Ala Phe Leu His Ala Thr Asp Leu Leu Pro
1 5 10

<210> 2012
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2012

Pro Ser Leu Arg Thr Leu Glu Asp Asn Glu Glu Arg Met Ser Arg Leu
1 5 10 15

Ser Lys Val Ala
20

<210> 2013
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2013

Pro Val Ile Lys Ala Arg Met Met Glu Tyr Gly Thr Thr Met Val Ser
1 5 10 15

Tyr Gln Pro Leu
20

<210> 2014
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2014

Gln His Leu Cys Gly Ser His Leu Val Glu Ala Leu Tyr Leu Val
1 5 10 15

<210> 2015
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2015

Arg Phe Lys Met Phe Pro Glu Val Lys
1 5

<210> 2016
<211> 10
<212> PRT
<213> Homo sapiens

<400> 2016

Arg Phe Lys Met Phe Pro Glu Val Lys Glu
1 5 10

<210> 2017
<211> 11
<212> PRT
<213> Homo sapiens

<400> 2017

Arg Phe Lys Met Phe Pro Glu Val Lys Glu Lys
1 5 10

<210> 2018
<211> 10
<212> PRT
<213> Homo sapiens

<400> 2018

Ser His Leu Val Glu Ala Leu Tyr Leu Val
1 5 10

<210> 2019
<211> 14
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2019

Ser Asn Val Glu Cys Asp Gly Leu Asn Cys Asp Trp Ile Ile
1 5 10

<210> 2020
<211> 16
<212> PRT
<213> Homo sapiens

<400> 2020

Ser Pro Ser Leu Trp Glu Ile Glu Phe Ala Lys Gln Leu Ala Ser Val
1 5 10 15

<210> 2021
<211> 16
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2021

Ser Pro Ser Leu Trp Glu Ile Glu Ile Ala Lys Gln Leu Ala Ser Val
1 5 10 15

<210> 2022
<211> 17
<212> PRT
<213> Homo sapiens

<400> 2022

Thr Arg Arg Glu Ala Glu Asp Leu Gln Val Gly Gln Val Glu Leu Gly
1 5 10 15

Gly

<210> 2023
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2023

Thr Ser Glu His Ser His Phe Ser Leu
1 5

<210> 2024
<211> 15

<212> PRT
<213> Homo sapiens

<400> 2024

Val Glu Ala Leu Tyr Leu Val Cys Gly Glu Arg Gly Phe Phe Tyr
1 5 10 15

<210> 2025
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2025

Val Met Asn Ile Leu Leu Gln Tyr Val
1 5

<210> 2026
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2026

Tyr Glu Met Val Phe Asp Gly Lys Pro Gln His Thr Asn Val Cys Phe
1 5 10 15

Trp Tyr Ile Pro
20

<210> 2027
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2027

Tyr Leu Val Cys Gly Glu Arg Gly Phe Phe Tyr Thr Pro Lys Thr
1 5 10 15

<210> 2028
<211> 979
<212> PRT
<213> Homo sapiens

<400> 2028

Met Arg Arg Pro Arg Arg Pro Gly Gly Leu Gly Gly Ser Gly Gly Leu
1 5 10 15

Arg Leu Leu Leu Cys Leu Leu Leu Leu Ser Ser Arg Pro Gly Gly Cys
20 25 30

Ser Ala Val Ser Ala His Gly Cys Leu Phe Asp Arg Arg Leu Cys Ser
35 40 45

```
His Leu Glu Val Cys Ile Gln Asp Gly Leu Phe Gly Gln Cys Gln Val
    50                  55                  60

Gly Val Gly Gln Ala Arg Pro Leu Leu Gln Val Thr Ser Pro Val Leu
65                  70                  75                  80

Gln Arg Leu Gln Gly Val Leu Arg Gln Leu Met Ser Gln Gly Leu Ser
                85                  90                  95

Trp His Asp Asp Leu Thr Gln Tyr Val Ile Ser Gln Glu Met Glu Arg
            100                 105                 110

Ile Pro Arg Leu Arg Pro Pro Glu Pro Arg Pro Arg Asp Arg Ser Gly
        115                 120                 125

Leu Ala Pro Lys Arg Pro Gly Pro Ala Gly Glu Leu Leu Leu Gln Asp
    130                 135                 140

Ile Pro Thr Gly Ser Ala Pro Ala Ala Gln His Arg Leu Pro Gln Pro
145                 150                 155                 160

Pro Val Gly Lys Gly Gly Ala Gly Ala Ser Ser Ser Leu Ser Pro Leu
                165                 170                 175

Gln Ala Glu Leu Leu Pro Pro Leu Leu Glu His Leu Leu Leu Pro Pro
            180                 185                 190

Gln Pro Pro His Pro Ser Leu Ser Tyr Glu Pro Ala Leu Leu Gln Pro
        195                 200                 205

Tyr Leu Phe His Gln Phe Gly Ser Arg Asp Gly Ser Arg Val Ser Glu
    210                 215                 220

Gly Ser Pro Gly Met Val Ser Val Gly Pro Leu Pro Lys Ala Glu Ala
225                 230                 235                 240

Pro Ala Leu Phe Ser Arg Thr Ala Ser Lys Gly Ile Phe Gly Asp His
                245                 250                 255

Pro Gly His Ser Tyr Gly Asp Leu Pro Gly Pro Ser Pro Ala Gln Leu
            260                 265                 270

Phe Gln Asp Ser Gly Leu Leu Tyr Leu Ala Gln Glu Leu Pro Ala Pro
        275                 280                 285

Ser Arg Ala Arg Val Pro Arg Leu Pro Glu Gln Gly Ser Ser Ser Arg
```

290 295 300

Ala Glu Asp Ser Pro Glu Gly Tyr Glu Lys Glu Gly Leu Gly Asp Arg
305 310 315 320

Gly Glu Lys Pro Ala Ser Pro Ala Val Gln Pro Asp Ala Ala Leu Gln
325 330 335

Arg Leu Ala Ala Val Leu Ala Gly Tyr Gly Val Glu Leu Arg Gln Leu
340 345 350

Thr Pro Glu Gln Leu Ser Thr Leu Leu Thr Leu Leu Gln Leu Leu Pro
355 360 365

Lys Gly Ala Gly Arg Asn Pro Gly Gly Val Val Asn Val Gly Ala Asp
370 375 380

Ile Lys Lys Thr Met Glu Gly Pro Val Glu Gly Arg Asp Thr Ala Glu
385 390 395 400

Leu Pro Ala Arg Thr Ser Pro Met Pro Gly His Pro Thr Ala Ser Pro
405 410 415

Thr Ser Ser Glu Val Gln Gln Val Pro Ser Pro Val Ser Ser Glu Pro
420 425 430

Pro Lys Ala Ala Arg Pro Pro Val Thr Pro Val Leu Leu Glu Lys Lys
435 440 445

Ser Pro Leu Gly Gln Ser Gln Pro Thr Val Ala Gly Gln Pro Ser Ala
450 455 460

Arg Pro Ala Ala Glu Glu Tyr Gly Tyr Ile Val Thr Asp Gln Lys Pro
465 470 475 480

Leu Ser Leu Ala Ala Gly Val Lys Leu Leu Glu Ile Leu Ala Glu His
485 490 495

Val His Met Ser Ser Gly Ser Phe Ile Asn Ile Ser Val Val Gly Pro
500 505 510

Ala Leu Thr Phe Arg Ile Arg His Asn Glu Gln Asn Leu Ser Leu Ala
515 520 525

Asp Val Thr Gln Gln Ala Gly Leu Val Lys Ser Glu Leu Glu Ala Gln
530 535 540

```
Thr Gly Leu Gln Ile Leu Gln Thr Gly Val Gly Gln Arg Glu Glu Ala
545                 550                 555                 560

Ala Ala Val Leu Pro Gln Thr Ala His Ser Thr Ser Pro Met Arg Ser
                565                 570                 575

Val Leu Leu Thr Leu Val Ala Leu Ala Gly Val Ala Gly Leu Leu Val
            580                 585                 590

Ala Leu Ala Val Ala Leu Cys Val Arg Gln His Ala Arg Gln Gln Asp
        595                 600                 605

Lys Glu Arg Leu Ala Ala Leu Gly Pro Glu Gly Ala His Gly Asp Thr
    610                 615                 620

Thr Phe Glu Tyr Gln Asp Leu Cys Arg Gln His Met Ala Thr Lys Ser
625                 630                 635                 640

Leu Phe Asn Arg Ala Glu Gly Pro Pro Glu Pro Ser Arg Val Ser Ser
                645                 650                 655

Val Ser Ser Gln Phe Ser Asp Ala Ala Gln Ala Ser Pro Ser Ser His
            660                 665                 670

Ser Ser Thr Pro Ser Trp Cys Glu Glu Pro Ala Gln Ala Asn Met Asp
        675                 680                 685

Ile Ser Thr Gly His Met Ile Leu Ala Tyr Met Glu Asp His Leu Arg
    690                 695                 700

Asn Arg Asp Arg Leu Ala Lys Glu Trp Gln Ala Leu Cys Ala Tyr Gln
705                 710                 715                 720

Ala Glu Pro Asn Thr Cys Ala Thr Ala Gln Gly Glu Gly Asn Ile Lys
                725                 730                 735

Lys Asn Arg His Pro Asp Phe Leu Pro Tyr Asp His Ala Arg Ile Lys
            740                 745                 750

Leu Lys Val Glu Ser Ser Pro Ser Arg Ser Asp Tyr Ile Asn Ala Ser
        755                 760                 765

Pro Ile Ile Glu His Asp Pro Arg Met Pro Ala Tyr Ile Ala Thr Gln
    770                 775                 780

Gly Pro Leu Ser His Thr Ile Ala Asp Phe Trp Gln Met Val Trp Glu
785                 790                 795                 800
```

```
Ser Gly Cys Thr Val Ile Val Met Leu Thr Pro Leu Val Glu Asp Gly
                805                 810                 815

Val Lys Gln Cys Asp Arg Tyr Trp Pro Asp Glu Gly Ala Ser Leu Tyr
            820                 825                 830

His Val Tyr Glu Val Asn Leu Val Ser Glu His Ile Trp Cys Glu Asp
        835                 840                 845

Phe Leu Val Arg Ser Phe Tyr Leu Lys Asn Val Gln Thr Gln Glu Thr
    850                 855                 860

Arg Thr Leu Thr Gln Phe His Phe Leu Ser Trp Pro Ala Glu Gly Thr
865                 870                 875                 880

Pro Ala Ser Thr Arg Pro Leu Leu Asp Phe Arg Arg Lys Val Asn Lys
                885                 890                 895

Cys Tyr Arg Gly Arg Ser Cys Pro Ile Ile Val His Cys Ser Asp Gly
            900                 905                 910

Ala Gly Arg Thr Gly Thr Tyr Ile Leu Ile Asp Met Val Leu Asn Arg
        915                 920                 925

Met Ala Lys Gly Val Lys Glu Ile Asp Ile Ala Ala Thr Leu Glu His
    930                 935                 940

Val Arg Asp Gln Arg Pro Gly Leu Val Arg Ser Lys Asp Gln Phe Glu
945                 950                 955                 960

Phe Ala Leu Thr Ala Val Ala Glu Glu Val Asn Ala Ile Leu Lys Ala
                965                 970                 975

Leu Pro Gln
```

<210> 2029
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2029

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Ala Ala Leu Gly Ile Gly Thr Asp Ser Val Ile Leu Ile Lys Cys Asp
1               5                   10                  15

Glu Arg Gly Lys
            20
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<210> 2030
<211> 12
<212> PRT
<213> Homo sapiens

<400> 2030

Ala Phe Ile Lys Ala Thr Gly Lys Lys Glu Asp Glu
1 5 10

<210> 2031
<211> 11
<212> PRT
<213> Mus musculus

<400> 2031

Ala Pro Val Ile Lys Ala Arg Met Met Glu Tyr
1 5 10

<210> 2032
<211> 13
<212> PRT
<213> Homo sapiens

<400> 2032

Cys Ala Tyr Gln Ala Glu Pro Asn Thr Cys Ala Thr Ala
1 5 10

<210> 2033
<211> 13
<212> PRT
<213> Homo sapiens

<400> 2033

Cys Thr Val Ile Val Met Leu Thr Pro Leu Val Glu Asp
1 5 10

<210> 2034
<211> 13
<212> PRT
<213> Homo sapiens

<400> 2034

Asp Gln Phe Glu Phe Ala Leu Thr Ala Val Ala Glu Glu
1 5 10

<210> 2035
<211> 15
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2035

Glu Lys Ala His Arg Pro Ile Trp Ala Arg Met Asp Ala Lys Lys
1 5 10 15

<210> 2036
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2036

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

Gly Ser Gly Asp
20

<210> 2037
<211> 15
<212> PRT
<213> Bos taurus

<400> 2037

Phe Lys Ala Asp Glu Lys Lys Phe Trp Gly Lys Tyr Leu Tyr Glu
1 5 10 15

<210> 2038
<211> 19
<212> PRT
<213> Homo sapiens

<400> 2038

Phe Tyr Leu Lys Asn Val Gln Thr Gln Glu Thr Arg Thr Leu Thr Gln
1 5 10 15

Phe His Phe

<210> 2039
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2039

Gly Met Ala Ala Leu Pro Arg Leu Ile Ala Phe Thr Ser Glu His Ser
1 5 10 15

His Phe Ser Leu
20

<210> 2040
<211> 13
<212> PRT
<213> Homo sapiens

<400> 2040

Gly Ser Phe Ile Asn Ile Ser Val Val Gly Pro Ala Leu
1 5 10

<210> 2041
<211> 18
<212> PRT
<213> Homo sapiens

<400> 2041

Gly Ser Leu Gln Pro Leu Ala Leu Glu Gly Ser Leu Gln Lys Arg Gly
1 5 10 15

Ile Val

<210> 2042
<211> 20
<212> PRT
<213> Mus musculus

<400> 2042

His Thr Pro Gly Val His Met Ala Ser Leu Ser Val Tyr Leu Lys Thr
1 5 10 15

Asn Val Phe Leu
20

<210> 2043
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2043

Ile Lys Ala Arg Met Met Glu Tyr Gly Thr Thr Met Val Ser Tyr
1 5 10 15

<210> 2044
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2044

Ile Lys Leu Lys Val Glu Ser Ser Pro Ser Arg Ser Asp Tyr Ile Asn
1 5 10 15

Ala Ser Pro Ile
            20

<210> 2045
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2045

Lys Tyr Asn Lys Ala Asn Val Phe Leu
1   5

<210> 2046
<211> 23
<212> PRT
<213> Homo sapiens

<400> 2046

Leu Ala Lys Glu Trp Gln Ala Leu Cys Ala Tyr Gln Ala Glu Pro Asn
1   5   10   15

Thr Cys Ala Thr Ala Gln Gly
            20

<210> 2047
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2047

Leu Ala Lys Leu Ser Asp Gly Val Ala Val Leu Lys Val Gly Gly
1   5   10   15

<210> 2048
<211> 13
<212> PRT
<213> Homo sapiens

<400> 2048

Leu Glu Ile Leu Ala Glu His Val His Met Ser Ser Gly
1   5   10

<210> 2049
<211> 19
<212> PRT
<213> Mus musculus

<400> 2049

Leu His Arg Ser Gly Val Leu Ile Ile His His Leu Gln Glu Asp Tyr

1 5 10 15

Arg Thr Tyr

<210> 2050
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2050

Leu Tyr His Val Tyr Glu Val Asn Leu Val Ser Glu His Ile Trp Cys
1 5 10 15

Glu Asp Phe Leu
20

<210> 2051
<211> 17
<212> PRT
<213> Homo sapiens

<400> 2051

Met Ala Ser Pro Gly Ser Gly Phe Trp Ser Phe Gly Ser Glu Asp Gly
1 5 10 15

Ser

<210> 2052
<211> 37
<212> PRT
<213> Homo sapiens

<400> 2052

Met Gly Ile Leu Lys Leu Gln Val Phe Leu Ile Val Leu Ser Val Ala
1 5 10 15

Leu Asn His Leu Lys Ala Thr Pro Ile Glu Ser His Gln Val Glu Lys
20 25 30

Arg Lys Cys Asn Thr
35

<210> 2053
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2053

Met Val Phe Asp Gly Lys Pro Gln His Thr Asn Val Cys Phe Trp
1 5 10 15

<210> 2054
<211> 21
<212> PRT
<213> Homo sapiens

<400> 2054

Met Val Trp Glu Ser Gly Cys Thr Val Ile Val Met Leu Thr Pro Leu
1 5 10 15

Val Glu Asp Gly Val
20

<210> 2055
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2055

Asn Arg Val Ala Pro Asn Val Arg Gln
1 5

<210> 2056
<211> 13
<212> PRT
<213> Homo sapiens

<400> 2056

Pro Ala Tyr Ile Ala Thr Gln Gly Pro Leu Ser His Thr
1 5 10

<210> 2057
<211> 15
<212> PRT
<213> Mus musculus

<400> 2057

Pro His Leu Val Glu Ala Leu Tyr Leu Val Cys Gly Glu Arg Gly
1 5 10 15

<210> 2058
<211> 13
<212> PRT
<213> Homo sapiens

<400> 2058

Pro Ser Leu Ser Tyr Glu Pro Ala Leu Leu Gln Pro Tyr

1 5 10

<210> 2059
<211> 15
<212> PRT
<213> Mus musculus

<400> 2059

Pro Val Ile Lys Ala Arg Met Met Glu Tyr Gly Thr Thr Met Val
1 5 10 15

<210> 2060
<211> 13
<212> PRT
<213> Homo sapiens

<400> 2060

Arg Ser Val Leu Leu Thr Leu Val Ala Leu Ala Gly Val
1 5 10

<210> 2061
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2061

Ser Glu His Ile Trp Cys Glu Asp Phe Leu Val Arg Ser Phe Tyr Leu
1 5 10 15

Lys Asn Val Gln
20

<210> 2062
<211> 15
<212> PRT
<213> Mus musculus

<400> 2062

Ser His Leu Val Glu Ala Leu Tyr Leu Val Ala Gly Glu Arg Gly
1 5 10 15

<210> 2063
<211> 21
<212> PRT
<213> Homo sapiens

<400> 2063

Ser Lys Asp Gln Phe Glu Phe Ala Leu Thr Ala Val Ala Glu Glu Val
1 5 10 15

Asn Ala Ile Leu Lys

20

<210> 2064
<211> 13
<212> PRT
<213> Homo sapiens

<400> 2064

Ser Leu Tyr His Val Tyr Glu Val Asn Leu Val Ser Glu
1 5 10

<210> 2065
<211> 10
<212> PRT
<213> Mus musculus

<400> 2065

Ser Leu Tyr Gln Leu Glu Asn Tyr Cys Asn
1 5 10

<210> 2066
<211> 18
<212> PRT
<213> Mus musculus

<400> 2066

Thr Ala Ala Leu Ser Tyr Thr Ile Ser Arg Met Glu Glu Ser Ser Val
1 5 10 15

Thr Leu

<210> 2067
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2067

Thr Gly His Pro Arg Tyr Phe Asn Gln Leu Ser Thr Gly Leu Asp
1 5 10 15

<210> 2068
<211> 13
<212> PRT
<213> Mus musculus

<400> 2068

Thr Gln Tyr Glu Ala Val Ala Thr Ser Asn Met Gln Glu
1 5 10

<210> 2069

<211> 13
<212> PRT
<213> Homo sapiens

<400> 2069

Thr Tyr Ile Leu Ile Asp Met Val Leu Asn Arg Met Ala
1 5 10

<210> 2070
<211> 16
<212> PRT
<213> Mus musculus

<400> 2070

Val Pro Pro Ser Leu Arg Thr Leu Glu Asp Asn Glu Glu Arg Met Ser
1 5 10 15

<210> 2071
<211> 16
<212> PRT
<213> Mus musculus

<400> 2071

Val Pro Thr Ser Leu Arg Arg Leu Glu Gln Pro Asn Val Ala Ile Ser
1 5 10 15

<210> 2072
<211> 18
<212> PRT
<213> Homo sapiens

<400> 2072

Val Ser Ser Gln Phe Ser Asp Ala Ala Gln Ala Ser Pro Ser Ser His
1 5 10 15

Ser Ser

<210> 2073
<211> 23
<212> PRT
<213> Mus musculus

<400> 2073

Trp Tyr Val Met Val Thr Ala Ala Leu Ser Tyr Thr Ile Ser Arg Met
1 5 10 15

Glu Glu Ser Ser Val Thr Leu
20

<210> 2074

<211> 979
<212> PRT
<213> Homo sapiens

<400> 2074

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Met Arg Arg Pro Arg Arg Pro Gly Gly Leu Gly Gly Ser Gly Gly Leu
1               5                  10                  15

Arg Leu Leu Leu Cys Leu Leu Leu Leu Ser Ser Arg Pro Gly Gly Cys
            20                  25                  30

Ser Ala Val Ser Ala His Gly Cys Leu Phe Asp Arg Arg Leu Cys Ser
        35                  40                  45

His Leu Glu Val Cys Ile Gln Asp Gly Leu Phe Gly Gln Cys Gln Val
    50                  55                  60

Gly Val Gly Gln Ala Arg Pro Leu Leu Gln Val Thr Ser Pro Val Leu
65                  70                  75                  80

Gln Arg Leu Gln Gly Val Leu Arg Gln Leu Met Ser Gln Gly Leu Ser
                85                  90                  95

Trp His Asp Asp Leu Thr Gln Tyr Val Ile Ser Gln Glu Met Glu Arg
            100                 105                 110

Ile Pro Arg Leu Arg Pro Pro Glu Pro Arg Pro Arg Asp Arg Ser Gly
        115                 120                 125

Leu Ala Pro Lys Arg Pro Gly Pro Ala Gly Glu Leu Leu Leu Gln Asp
    130                 135                 140

Ile Pro Thr Gly Ser Ala Pro Ala Ala Gln His Arg Leu Pro Gln Pro
145                 150                 155                 160

Pro Val Gly Lys Gly Gly Ala Gly Ala Ser Ser Ser Leu Ser Pro Leu
                165                 170                 175

Gln Ala Glu Leu Leu Pro Pro Leu Leu Glu His Leu Leu Leu Pro Pro
            180                 185                 190

Gln Pro Pro His Pro Ser Leu Ser Tyr Glu Pro Ala Leu Leu Gln Pro
        195                 200                 205

Tyr Leu Phe His Gln Phe Gly Ser Arg Asp Gly Ser Arg Val Ser Glu
    210                 215                 220

Gly Ser Pro Gly Met Val Ser Val Gly Pro Leu Pro Lys Ala Glu Ala
```

225 230 235 240

Pro Ala Leu Phe Ser Arg Thr Ala Ser Lys Gly Ile Phe Gly Asp His
245 250 255

Pro Gly His Ser Tyr Gly Asp Leu Pro Gly Pro Ser Pro Ala Gln Leu
260 265 270

Phe Gln Asp Ser Gly Leu Leu Tyr Leu Ala Gln Glu Leu Pro Ala Pro
275 280 285

Ser Arg Ala Arg Val Pro Arg Leu Pro Glu Gln Gly Ser Ser Ser Arg
290 295 300

Ala Glu Asp Ser Pro Glu Gly Tyr Glu Lys Glu Gly Leu Gly Asp Arg
305 310 315 320

Gly Glu Lys Pro Ala Ser Pro Ala Val Gln Pro Asp Ala Ala Leu Gln
325 330 335

Arg Leu Ala Ala Val Leu Ala Gly Tyr Gly Val Glu Leu Arg Gln Leu
340 345 350

Thr Pro Glu Gln Leu Ser Thr Leu Leu Thr Leu Leu Gln Leu Leu Pro
355 360 365

Lys Gly Ala Gly Arg Asn Pro Gly Gly Val Val Asn Val Gly Ala Asp
370 375 380

Ile Lys Lys Thr Met Glu Gly Pro Val Glu Gly Arg Asp Thr Ala Glu
385 390 395 400

Leu Pro Ala Arg Thr Ser Pro Met Pro Gly His Pro Thr Ala Ser Pro
405 410 415

Thr Ser Ser Glu Val Gln Gln Val Pro Ser Pro Val Ser Ser Glu Pro
420 425 430

Pro Lys Ala Ala Arg Pro Pro Val Thr Pro Val Leu Leu Glu Lys Lys
435 440 445

Ser Pro Leu Gly Gln Ser Gln Pro Thr Val Ala Gly Gln Pro Ser Ala
450 455 460

Arg Pro Ala Ala Glu Glu Tyr Gly Tyr Ile Val Thr Asp Gln Lys Pro
465 470 475 480

```
Leu Ser Leu Ala Ala Gly Val Lys Leu Leu Glu Ile Leu Ala Glu His
                485                 490                 495

Val His Met Ser Ser Gly Ser Phe Ile Asn Ile Ser Val Val Gly Pro
            500                 505                 510

Ala Leu Thr Phe Arg Ile Arg His Asn Glu Gln Asn Leu Ser Leu Ala
        515                 520                 525

Asp Val Thr Gln Gln Ala Gly Leu Val Lys Ser Glu Leu Glu Ala Gln
    530                 535                 540

Thr Gly Leu Gln Ile Leu Gln Thr Gly Val Gly Gln Arg Glu Glu Ala
545                 550                 555                 560

Ala Ala Val Leu Pro Gln Thr Ala His Ser Thr Ser Pro Met Arg Ser
                565                 570                 575

Val Leu Leu Thr Leu Val Ala Leu Ala Gly Val Ala Gly Leu Leu Val
            580                 585                 590

Ala Leu Ala Val Ala Leu Cys Val Arg Gln His Ala Arg Gln Gln Asp
        595                 600                 605

Lys Glu Arg Leu Ala Ala Leu Gly Pro Glu Gly Ala His Gly Asp Thr
    610                 615                 620

Thr Phe Glu Tyr Gln Asp Leu Cys Arg Gln His Met Ala Thr Lys Ser
625                 630                 635                 640

Leu Phe Asn Arg Ala Glu Gly Pro Pro Glu Pro Ser Arg Val Ser Ser
                645                 650                 655

Val Ser Ser Gln Phe Ser Asp Ala Ala Gln Ala Ser Pro Ser Ser His
            660                 665                 670

Ser Ser Thr Pro Ser Trp Cys Glu Glu Pro Ala Gln Ala Asn Met Asp
        675                 680                 685

Ile Ser Thr Gly His Met Ile Leu Ala Tyr Met Glu Asp His Leu Arg
    690                 695                 700

Asn Arg Asp Arg Leu Ala Lys Glu Trp Gln Ala Leu Cys Ala Tyr Gln
705                 710                 715                 720

Ala Glu Pro Asn Thr Cys Ala Thr Ala Gln Gly Glu Gly Asn Ile Lys
                725                 730                 735
```

```
Lys Asn Arg His Pro Asp Phe Leu Pro Tyr Asp His Ala Arg Ile Lys
            740                 745                 750

Leu Lys Val Glu Ser Ser Pro Ser Arg Ser Asp Tyr Ile Asn Ala Ser
        755                 760                 765

Pro Ile Ile Glu His Asp Pro Arg Met Pro Ala Tyr Ile Ala Thr Gln
    770                 775                 780

Gly Pro Leu Ser His Thr Ile Ala Asp Phe Trp Gln Met Val Trp Glu
785                 790                 795                 800

Ser Gly Cys Thr Val Ile Val Met Leu Thr Pro Leu Val Glu Asp Gly
                805                 810                 815

Val Lys Gln Cys Asp Arg Tyr Trp Pro Asp Glu Gly Ala Ser Leu Tyr
            820                 825                 830

His Val Tyr Glu Val Asn Leu Val Ser Glu His Ile Trp Cys Glu Asp
        835                 840                 845

Phe Leu Val Arg Ser Phe Tyr Leu Lys Asn Val Gln Thr Gln Glu Thr
    850                 855                 860

Arg Thr Leu Thr Gln Phe His Phe Leu Ser Trp Pro Ala Glu Gly Thr
865                 870                 875                 880

Pro Ala Ser Thr Arg Pro Leu Leu Asp Phe Arg Arg Lys Val Asn Lys
                885                 890                 895

Cys Tyr Arg Gly Arg Ser Cys Pro Ile Ile Val His Cys Ser Asp Gly
            900                 905                 910

Ala Gly Arg Thr Gly Thr Tyr Ile Leu Ile Asp Met Val Leu Asn Arg
        915                 920                 925

Met Ala Lys Gly Val Lys Glu Ile Asp Ile Ala Ala Thr Leu Glu His
    930                 935                 940

Val Arg Asp Gln Arg Pro Gly Leu Val Arg Ser Lys Asp Gln Phe Glu
945                 950                 955                 960

Phe Ala Leu Thr Ala Val Ala Glu Glu Val Asn Ala Ile Leu Lys Ala
                965                 970                 975

Leu Pro Gln
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<210> 2075
<211> 11
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2075

Ala Val Arg Pro Leu Trp Val Arg Met Glu Ala
1 5 10

<210> 2076
<211> 10
<212> PRT
<213> Homo sapiens

<400> 2076

Asp Thr Thr Phe Glu Tyr Gln Asp Leu Cys
1 5 10

<210> 2077
<211> 11
<212> PRT
<213> Mus musculus

<400> 2077

Glu Ala Leu Tyr Leu Val Cys Gly Glu Arg Gly
1 5 10

<210> 2078
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2078

Glu Leu Ala Glu Tyr Leu Tyr Asn Ile
1 5

<210> 2079
<211> 10
<212> PRT
<213> Homo sapiens

<400> 2079

Gly Ala His Gly Asp Thr Thr Phe Glu Tyr
1 5 10

<210> 2080
<211> 7
<212> PRT

<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2080

Gly Glu Arg Ala Lys Arg Ser
1 5

<210> 2081
<211> 12
<212> PRT
<213> Bos taurus

<400> 2081

Gly Ile Val Glu Gln Cys Cys Ala Ser Val Cys Ser
1 5 10

<210> 2082
<211> 15
<212> PRT
<213> Bos taurus

<400> 2082

Gly Ile Val Glu Gln Cys Cys Ala Ser Val Cys Ser Leu Tyr Gln
1 5 10 15

<210> 2083
<211> 12
<212> PRT
<213> Homo sapiens

<400> 2083

Gly Ile Val Glu Gln Cys Cys Thr Ser Ile Cys Ser
1 5 10

<210> 2084
<211> 23
<212> PRT
<213> Mus musculus

<400> 2084

Gly Arg His Ser Ala Glu Tyr Tyr Asn Lys Gln Tyr Leu Glu Arg Thr
1 5 10 15

Arg Ala Glu Leu Asp Thr Ala
20

<210> 2085
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2085

Ile Leu Met His Cys Gln Thr Thr Leu
1 5

<210> 2086
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2086

Leu Asp Gln Arg Ser Ser Lys
1 5

<210> 2087
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2087

Leu Asp Gln Ser Arg Leu Lys
1 5

<210> 2088
<211> 19
<212> PRT
<213> Mus musculus

<400> 2088

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

Ser Arg Leu

<210> 2089
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2089

Leu Pro Gly Glu Arg Gln Ile
1 5

<210> 2090
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2090

Leu Pro Asn Arg Ser Gln Ile
1 5

<210> 2091
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2091

Asn Ile Lys Ser Ser Leu Pro
1 5

<210> 2092
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2092

Asn Pro Gly Ser Ser Leu Gly
1 5

<210> 2093
<211> 17
<212> PRT
<213> Mus musculus

<400> 2093

Asn Ser Gln Pro Glu Ile Leu Glu Arg Thr Arg Ala Glu Val Asp Thr
1 5 10 15

Ala

<210> 2094
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2094

Pro Asp Gly Ser Arg Leu Val
1   5

<210> 2095
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2095

Pro Gly Ser Arg Leu Gln Pro
1   5

<210> 2096
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2096

Pro Gly Thr Arg Leu Gln Pro
1   5

<210> 2097
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2097

Pro Ser Arg Leu Val Asn Gln
1   5

<210> 2098
<211> 12
<212> PRT
<213> Bos taurus

<400> 2098

Gln Cys Cys Ala Ser Val Cys Ser Leu Tyr Gln Leu
1   5   10

<210> 2099

<211> 12
<212> PRT
<213> Homo sapiens

<400> 2099

Gln Cys Cys Thr Ser Ile Cys Ser Leu Tyr Gln Leu
1 5 10

<210> 2100
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2100

Gln Gly Glu Arg Ser Gly Pro
1 5

<210> 2101
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2101

Gln Arg Ser Gly Arg Gly Pro
1 5

<210> 2102
<211> 15
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2102

Ser His Leu Val Glu Ala Leu Ala Leu Val Ala Gly Glu Arg Gly
1 5 10 15

<210> 2103
<211> 8
<212> PRT
<213> Mus musculus

<400> 2103

Ser His Leu Val Glu Ala Leu Tyr
1 5

<210> 2104
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2104

Ser Thr Gly Glu Arg Ile Gln
1 5

<210> 2105
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2105

Thr Asn Met Phe Thr Tyr Glu Ile Ala Pro Val Phe Val Leu Leu Glu
1 5 10 15

Tyr Val Thr Leu
20

<210> 2106
<211> 13
<212> PRT
<213> Bos taurus

<400> 2106

Val Cys Gly Glu Arg Gly Phe Phe Tyr Thr Pro Lys Ala
1 5 10

<210> 2107
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2107

Val Gly Glu Arg Gly Ser Lys
1 5

<210> 2108
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2108

Val Ile Gln Gly Ser Gln Leu
1 5

<210> 2109
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2109

Val Ile Gln Gly Ser Arg Leu
1 5

<210> 2110
<211> 24
<212> PRT
<213> Mus musculus

<400> 2110

Val Leu Gly Gly Gly Cys Ala Leu Leu Arg Cys Ile Pro Ala Leu Asp
1 5 10 15

Ser Leu Lys Pro Ala Asn Glu Asp
20

<210> 2111
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2111

Val Pro Gln Gln Ser Ile Pro
1 5

<210> 2112
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2112

Val Arg Gly Arg Gly Ser Lys
1 5

<210> 2113

<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2113

Val Ser Arg Ser Leu Leu Asp
1 5

<210> 2114
<211> 585
<212> PRT
<213> Homo sapiens

<400> 2114

Met Ala Ser Pro Gly Ser Gly Phe Trp Ser Phe Gly Ser Glu Asp Gly
1 5 10 15

Ser Gly Asp Ser Glu Asn Pro Gly Thr Ala Arg Ala Trp Cys Gln Val
20 25 30

Ala Gln Lys Phe Thr Gly Gly Ile Gly Asn Lys Leu Cys Ala Leu Leu
35 40 45

Tyr Gly Asp Ala Glu Lys Pro Ala Glu Ser Gly Gly Ser Gln Pro Pro
50 55 60

Arg Ala Ala Ala Arg Lys Ala Ala Cys Ala Cys Asp Gln Lys Pro Cys
65 70 75 80

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

Leu Leu Pro Ala Cys Asp Gly Glu Arg Pro Thr Leu Ala Phe Leu Gln
100 105 110

Asp Val Met Asn Ile Leu Leu Gln Tyr Val Val Lys Ser Phe Asp Arg
115 120 125

Ser Thr Lys Val Ile Asp Phe His Tyr Pro Asn Glu Leu Leu Gln Glu
130 135 140

Tyr Asn Trp Glu Leu Ala Asp Gln Pro Gln Asn Leu Glu Glu Ile Leu
145 150 155 160

Met His Cys Gln Thr Thr Leu Lys Tyr Ala Ile Lys Thr Gly His Pro
165 170 175

```
Arg Tyr Phe Asn Gln Leu Ser Thr Gly Leu Asp Met Val Gly Leu Ala
            180                 185                 190

Ala Asp Trp Leu Thr Ser Thr Ala Asn Thr Asn Met Phe Thr Tyr Glu
        195                 200                 205

Ile Ala Pro Val Phe Val Leu Leu Glu Tyr Val Thr Leu Lys Lys Met
    210                 215                 220

Arg Glu Ile Ile Gly Trp Pro Gly Gly Ser Gly Asp Gly Ile Phe Ser
225                 230                 235                 240

Pro Gly Gly Ala Ile Ser Asn Met Tyr Ala Met Met Ile Ala Arg Phe
                245                 250                 255

Lys Met Phe Pro Glu Val Lys Glu Lys Gly Met Ala Ala Leu Pro Arg
            260                 265                 270

Leu Ile Ala Phe Thr Ser Glu His Ser His Phe Ser Leu Lys Lys Gly
        275                 280                 285

Ala Ala Ala Leu Gly Ile Gly Thr Asp Ser Val Ile Leu Ile Lys Cys
    290                 295                 300

Asp Glu Arg Gly Lys Met Ile Pro Ser Asp Leu Glu Arg Arg Ile Leu
305                 310                 315                 320

Glu Ala Lys Gln Lys Gly Phe Val Pro Phe Leu Val Ser Ala Thr Ala
                325                 330                 335

Gly Thr Thr Val Tyr Gly Ala Phe Asp Pro Leu Leu Ala Val Ala Asp
            340                 345                 350

Ile Cys Lys Lys Tyr Lys Ile Trp Met His Val Asp Ala Ala Trp Gly
        355                 360                 365

Gly Gly Leu Leu Met Ser Arg Lys His Lys Trp Lys Leu Ser Gly Val
    370                 375                 380

Glu Arg Ala Asn Ser Val Thr Trp Asn Pro His Lys Met Met Gly Val
385                 390                 395                 400

Pro Leu Gln Cys Ser Ala Leu Leu Val Arg Glu Glu Gly Leu Met Gln
                405                 410                 415

Asn Cys Asn Gln Met His Ala Ser Tyr Leu Phe Gln Gln Asp Lys His
            420                 425                 430
```

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Tyr Asp Leu Ser Tyr Asp Thr Gly Asp Lys Ala Leu Gln Cys Gly Arg
        435                 440                 445

His Val Asp Val Phe Lys Leu Trp Leu Met Trp Arg Ala Lys Gly Thr
    450                 455                 460

Thr Gly Phe Glu Ala His Val Asp Lys Cys Leu Glu Leu Ala Glu Tyr
465                 470                 475                 480

Leu Tyr Asn Ile Ile Lys Asn Arg Glu Gly Tyr Glu Met Val Phe Asp
                485                 490                 495

Gly Lys Pro Gln His Thr Asn Val Cys Phe Trp Tyr Ile Pro Pro Ser
            500                 505                 510

Leu Arg Thr Leu Glu Asp Asn Glu Glu Arg Met Ser Arg Leu Ser Lys
        515                 520                 525

Val Ala Pro Val Ile Lys Ala Arg Met Met Glu Tyr Gly Thr Thr Met
    530                 535                 540

Val Ser Tyr Gln Pro Leu Gly Asp Lys Val Asn Phe Phe Arg Met Val
545                 550                 555                 560

Ile Ser Asn Pro Ala Ala Thr His Gln Asp Ile Asp Phe Leu Ile Glu
                565                 570                 575

Glu Ile Glu Arg Leu Gly Gln Asp Leu
            580                 585


<210>  2115
<211>  30
<212>  PRT
<213>  Homo sapiens

<400>  2115

Ala Ala Ala Phe Val Asn Gln His Leu Cys Gly Ser His Leu Val Glu
1               5                   10                  15

Ala Leu Tyr Leu Val Cys Gly Glu Arg Gly Phe Phe Tyr Thr
            20                  25                  30


<210>  2116
<211>  9
<212>  PRT
<213>  Mus musculus

<400>  2116
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Ala Leu Ile Pro Tyr Cys Val His Met
1 5

<210> 2117
<211> 9
<212> PRT
<213> Mus musculus

<400> 2117

Ala Leu Ser Tyr Thr Ile Ser Arg Met
1 5

<210> 2118
<211> 9
<212> PRT
<213> Mus musculus

<400> 2118

Ala Thr His Phe Pro His Gln Val Ile
1 5

<210> 2119
<211> 9
<212> PRT
<213> Mus musculus

<400> 2119

Cys Ala Leu Thr Ser Leu Thr Thr Met
1 5

<210> 2120
<211> 9
<212> PRT
<213> Mus musculus

<400> 2120

Cys Ala Asn Pro Asp Trp Ile His Ile
1 5

<210> 2121
<211> 21
<212> PRT
<213> Homo sapiens

<400> 2121

Cys Gly Arg His Val Asp Val Phe Lys Leu Trp Leu Met Trp Arg Ala
1 5 10 15

Lys Gly Thr Thr Gly
20

<210> 2122
<211> 9
<212> PRT
<213> Mus musculus

<400> 2122

Cys Lys Ser Ala Ser Ile Pro Leu Met
1 5

<210> 2123
<211> 9
<212> PRT
<213> Mus musculus

<400> 2123

Cys Gln Gly Glu Asn Gly Thr Lys Pro
1 5

<210> 2124
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2124

Asp Glu Arg Gly Lys Met Ile Pro Ser Asp Leu Glu Arg Arg Ile Leu
1 5 10 15

Glu Ala Lys Gln
20

<210> 2125
<211> 9
<212> PRT
<213> Mus musculus

<400> 2125

Asp Phe Leu His Arg Ser Gly Val Leu
1 5

<210> 2126
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2126

Asp Ser Tyr Glu Ile Met Gln Gly Arg Ala Val Val
1 5 10

<210> 2127
<211> 9
<212> PRT
<213> Mus musculus

<400> 2127

Asp Tyr Arg Thr Tyr Tyr Gly Phe Leu
1 5

<210> 2128
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2128

Glu Glu Ile Leu Met His Cys Gln Thr Thr Leu Lys Tyr Ala Ile Lys
1 5 10 15

Thr Gly His Pro
20

<210> 2129
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2129

Glu Arg Ala Asn Ser Val Thr Trp Asn Pro His Lys Met Met Gly Val
1 5 10 15

Pro Leu Gln Cys
20

<210> 2130
<211> 9
<212> PRT
<213> Mus musculus

<400> 2130

Glu Ser Ser Val Thr Leu His Arg Leu
1 5

<210> 2131
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2131

Glu Tyr Gly Thr Thr Met Val Ser Tyr Gln Pro Leu Gly Asp Lys Val
1 5 10 15

Asn Phe Phe Arg
20

<210> 2132
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2132

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

Phe Asp Gly Lys
20

<210> 2133
<211> 9
<212> PRT
<213> Mus musculus

<400> 2133

Phe Ala Ile Asn Ser Glu Met Phe Leu
1 5

<210> 2134
<211> 9
<212> PRT
<213> Mus musculus

<400> 2134

Phe Glu His Thr Pro Gly Val His Met
1 5

<210> 2135
<211> 9
<212> PRT
<213> Mus musculus

<400> 2135

Phe Gly Ile Asp Leu Leu Trp Ser Val
1 5

<210> 2136
<211> 9
<212> PRT
<213> Mus musculus

<400> 2136

Phe Leu His Arg Ser Gly Val Leu Ile
1 5

<210> 2137
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2137

Phe Leu Trp Ser Val Phe Trp Leu Ile
1 5

<210> 2138
<211> 9
<212> PRT
<213> Mus musculus

<400> 2138

Gly Asp Pro Arg Asn Ile Phe Ser Ile
1 5

<210> 2139
<211> 9
<212> PRT
<213> Mus musculus

<400> 2139

Gly Phe Ala Ile Asn Ser Glu Met Phe
1 5

<210> 2140
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2140

Gly Gly Ser Gly Asp Gly Ile Phe Ser Pro Gly Gly Ala Ile Ser Asn
1 5 10 15

Met Tyr Ala Met
20

<210> 2141
<211> 9
<212> PRT
<213> Mus musculus

<400> 2141

Gly His Ala Met Gly Ser Ser Cys Val
1 5

<210> 2142
<211> 9
<212> PRT
<213> Mus musculus

<400> 2142

Gly Leu Val Arg Asn Leu Gly Val Leu
1 5

<210> 2143
<211> 9
<212> PRT
<213> Mus musculus

<400> 2143

Gly Thr Lys Pro Ser Phe Arg Leu Leu
1 5

<210> 2144
<211> 9
<212> PRT
<213> Mus musculus

<400> 2144

His Ala Glu Pro Leu Phe Tyr Leu Leu
1 5

<210> 2145
<211> 9
<212> PRT
<213> Mus musculus

<400> 2145

His Met Ala Ser Leu Ser Val Tyr Leu
1 5

<210> 2146
<211> 9
<212> PRT
<213> Mus musculus

<400> 2146

Ile Tyr Phe Pro Leu Trp Phe Gln Leu
1 5

<210> 2147
<211> 9
<212> PRT
<213> Mus musculus

<400> 2147

Ile Tyr Pro Asn His Ser Ser Pro Cys
1 5

<210> 2148

<211> 22
<212> PRT
<213> Homo sapiens

<400> 2148

Lys Gly Thr Thr Gly Phe Glu Ala His Val Asp Lys Cys Leu Glu Leu
1 5 10 15

Ala Glu Tyr Leu Tyr Asn
20

<210> 2149
<211> 9
<212> PRT
<213> Mus musculus

<400> 2149

Lys Ile Pro Thr His Ala Glu Pro Leu
1 5

<210> 2150
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2150

Lys Thr Gly His Pro Arg Tyr Phe Asn Gln Leu Ser Thr Gly Leu Asp
1 5 10 15

Met Val Gly Leu
20

<210> 2151
<211> 9
<212> PRT
<213> Mus musculus

<400> 2151

Lys Trp Cys Ala Asn Pro Asp Trp Ile
1 5

<210> 2152
<211> 22
<212> PRT
<213> Homo sapiens

<400> 2152

Leu Ala Phe Leu Gln Asp Val Met Asn Ile Leu Leu Gln Tyr Val Val
1 5 10 15

Lys Ser Phe Asp Arg Ser

20

<210> 2153
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2153

Leu Glu Ala Lys Gln Lys Gly Phe Val Pro Phe Leu Val Ser Ala Thr
1 5 10 15

Ala Gly Thr Thr
20

<210> 2154
<211> 9
<212> PRT
<213> Mus musculus

<400> 2154

Leu Gly Phe Ala Ile Asn Ser Glu Met
1 5

<210> 2155
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2155

Leu Leu Tyr Gly Asp Ala Glu Lys Pro Ala Glu Ser Gly Gly Ser Gln
1 5 10 15

Pro Pro Arg Ala
20

<210> 2156
<211> 9
<212> PRT
<213> Mus musculus

<400> 2156

Leu Arg Leu Phe Gly Ile Asp Leu Leu
1 5

<210> 2157
<211> 9
<212> PRT
<213> Mus musculus

<400> 2157

Leu Ser Phe Cys Lys Ser Ala Ser Ile

1 5

<210> 2158
<211> 9
<212> PRT
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<400> 2158

Leu Ser Val Tyr Leu Lys Thr Asn Val
1 5

<210> 2159
<211> 9
<212> PRT
<213> Mus musculus

<400> 2159

Leu Thr Ser Leu Thr Thr Met Gln Leu
1 5

<210> 2160
<211> 9
<212> PRT
<213> Mus musculus

<400> 2160

Met Gln Leu Tyr Arg Phe Ile Lys Ile
1 5

<210> 2161
<211> 11
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2161

Met Tyr Glu Leu Leu Gln Pro Ala Ala Ile Val
1 5 10

<210> 2162
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2162

Asn Leu Phe Leu Phe Leu Phe Ala Val
1 5

<210> 2163
<211> 9

<212> PRT
<213> Mus musculus

<400> 2163

Asn Gln Asn Val Gly Thr Lys Met Ile
1 5

<210> 2164
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2164

Pro Glu Val Lys Glu Lys Gly Met Ala Ala Leu Pro Arg Leu Ile Ala
1 5 10 15

Phe Thr Ser Glu
20

<210> 2165
<211> 14
<212> PRT
<213> Mus musculus

<400> 2165

Pro Ser Leu Trp Glu Ile Glu Phe Ala Lys Gln Leu Ala Ser
1 5 10

<210> 2166
<211> 9
<212> PRT
<213> Mus musculus

<400> 2166

Gln Leu Asn Gln Asn Val Gly Thr Lys
1 5

<210> 2167
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2167

Gln Asn Cys Asn Gln Met His Ala Ser Tyr Leu Phe Gln Gln Asp Lys
1 5 10 15

His Tyr Asp Leu
20

<210> 2168
<211> 9

<212> PRT
<213> Mus musculus

<400> 2168

Arg Phe Ile Lys Ile Pro Thr His Ala
1 5

<210> 2169
<211> 9
<212> PRT
<213> Mus musculus

<400> 2169

Arg Met Glu Glu Ser Ser Val Thr Leu
1 5

<210> 2170
<211> 9
<212> PRT
<213> Mus musculus

<400> 2170

Ser Phe Cys Lys Ser Ala Ser Ile Pro
1 5

<210> 2171
<211> 9
<212> PRT
<213> Mus musculus

<400> 2171

Ser Phe Leu Trp Ser Val Phe Trp Leu
1 5

<210> 2172
<211> 9
<212> PRT
<213> Mus musculus

<400> 2172

Ser Arg Met Glu Glu Ser Ser Val Thr
1 5

<210> 2173
<211> 9
<212> PRT
<213> Mus musculus

<400> 2173

Ser Arg Val Phe Ile Ala Thr His Phe
1 5

<210> 2174
<211> 9
<212> PRT
<213> Mus musculus

<400> 2174

Thr His Ala Glu Pro Leu Phe Tyr Leu
1 5

<210> 2175
<211> 9
<212> PRT
<213> Mus musculus

<400> 2175

Thr His Phe Pro His Gln Val Ile Leu
1 5

<210> 2176
<211> 9
<212> PRT
<213> Mus musculus

<400> 2176

Thr Ser Leu Thr Thr Met Gln Leu Tyr
1 5

<210> 2177
<211> 9
<212> PRT
<213> Mus musculus

<400> 2177

Thr Tyr Tyr Gly Phe Leu Asn Phe Met
1 5

<210> 2178
<211> 30
<212> PRT
<213> Homo sapiens

<400> 2178

Val Cys Gly Glu Arg Gly Phe Phe Tyr Thr Pro Lys Thr Arg Arg Glu
1 5 10 15

Ala Glu Asp Leu Gln Val Gly Gln Val Glu Leu Gly Gly Gly
20 25 30

<210> 2179
<211> 9
<212> PRT

<213> Mus musculus

<400> 2179

Val Phe Trp Leu Ile Gln Ile Ser Val
1 5

<210> 2180
<211> 9
<212> PRT
<213> Mus musculus

<400> 2180

Tyr Leu Lys Thr Asn Val Phe Leu Phe
1 5

<210> 2181
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2181

Tyr Leu Leu Leu Arg Val Leu Asn Ile
1 5

<210> 2182
<211> 9
<212> PRT
<213> Mus musculus

<400> 2182

Tyr Pro Asn His Ser Ser Pro Cys Leu
1 5

<210> 2183
<211> 9
<212> PRT
<213> Mus musculus

<400> 2183

Tyr Thr Ile Ser Arg Met Glu Glu Ser
1 5

<210> 2184
<211> 10
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2184

Tyr Val Arg Pro Leu Trp Val Arg Met Glu

1 5 10

<210> 2185
<211> 10
<212> PRT
<213> Homo sapiens

<400> 2185

Ala Leu Trp Met Arg Leu Leu Pro Leu Leu
1 5 10

<210> 2186
<211> 13
<212> PRT
<213> Homo sapiens

<400> 2186

Asp Trp Ile His Ile Asp Thr Thr Pro Phe Ala Gly Leu
1 5 10

<210> 2187
<211> 13
<212> PRT
<213> Homo sapiens

<400> 2187

Glu Trp Val His Ile Asp Thr Thr Pro Phe Ala Ser Leu
1 5 10

<210> 2188
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2188

Phe Tyr Thr Pro Lys Thr Arg Arg Glu
1 5

<210> 2189
<211> 8
<212> PRT
<213> Homo sapiens

<400> 2189

Gly Glu Arg Gly Phe Phe Tyr Thr
1 5

<210> 2190
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2190

Leu Pro Leu Leu Ala Leu Leu Ala Leu
1 5

<210> 2191
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2191

Leu Trp Met Arg Leu Leu Pro Leu Leu
1 5

<210> 2192
<211> 5
<212> PRT
<213> Homo sapiens

<400> 2192

Pro Ala Glu Gly Thr
1 5

<210> 2193
<211> 13
<212> PRT
<213> Homo sapiens

<400> 2193

Gln His Leu Gln Lys Asp Tyr Arg Ala Tyr Tyr Thr Phe
1 5 10

<210> 2194
<211> 13
<212> PRT
<213> Homo sapiens

<400> 2194

Arg Val Leu Asn Ile Asp Leu Leu Trp Ser Val Pro Ile
1 5 10

<210> 2195
<211> 31
<212> PRT
<213> Homo sapiens

<400> 2195

Trp Cys Glu Asp Phe Leu Val Arg Ser Phe Tyr Leu Lys Asn Val Gln
1 5 10 15

Thr Gln Glu Thr Arg Thr Leu Thr Gln Phe His Phe Leu Ser Trp
20 25 30

<210> 2196
<211> 10
<212> PRT
<213> Homo sapiens

<400> 2196

Trp Met Arg Leu Leu Pro Leu Leu Ala Leu
1 5 10

<210> 2197
<211> 13
<212> PRT
<213> Homo sapiens

<400> 2197

Tyr Thr Phe Leu Asn Phe Met Ser Asn Val Gly Asp Pro
1 5 10

<210> 2198
<211> 979
<212> PRT
<213> Homo sapiens

<400> 2198

Met Arg Arg Pro Arg Arg Pro Gly Gly Leu Gly Gly Ser Gly Gly Leu
1 5 10 15

Arg Leu Leu Leu Cys Leu Leu Leu Leu Ser Ser Arg Pro Gly Gly Cys
20 25 30

Ser Ala Val Ser Ala His Gly Cys Leu Phe Asp Arg Arg Leu Cys Ser
35 40 45

His Leu Glu Val Cys Ile Gln Asp Gly Leu Phe Gly Gln Cys Gln Val
50 55 60

Gly Val Gly Gln Ala Arg Pro Leu Leu Gln Val Thr Ser Pro Val Leu
65 70 75 80

Gln Arg Leu Gln Gly Val Leu Arg Gln Leu Met Ser Gln Gly Leu Ser
85 90 95

Trp His Asp Asp Leu Thr Gln Tyr Val Ile Ser Gln Glu Met Glu Arg
100 105 110

Ile Pro Arg Leu Arg Pro Pro Glu Pro Arg Pro Arg Asp Arg Ser Gly
115 120 125

```
Leu Ala Pro Lys Arg Pro Gly Pro Ala Gly Glu Leu Leu Leu Gln Asp
    130                 135                 140

Ile Pro Thr Gly Ser Ala Pro Ala Ala Gln His Arg Leu Pro Gln Pro
145                 150                 155                 160

Pro Val Gly Lys Gly Gly Ala Gly Ala Ser Ser Ser Leu Ser Pro Leu
                165                 170                 175

Gln Ala Glu Leu Leu Pro Pro Leu Leu Glu His Leu Leu Leu Pro Pro
            180                 185                 190

Gln Pro Pro His Pro Ser Leu Ser Tyr Glu Pro Ala Leu Leu Gln Pro
        195                 200                 205

Tyr Leu Phe His Gln Phe Gly Ser Arg Asp Gly Ser Arg Val Ser Glu
    210                 215                 220

Gly Ser Pro Gly Met Val Ser Val Gly Pro Leu Pro Lys Ala Glu Ala
225                 230                 235                 240

Pro Ala Leu Phe Ser Arg Thr Ala Ser Lys Gly Ile Phe Gly Asp His
                245                 250                 255

Pro Gly His Ser Tyr Gly Asp Leu Pro Gly Pro Ser Pro Ala Gln Leu
            260                 265                 270

Phe Gln Asp Ser Gly Leu Leu Tyr Leu Ala Gln Glu Leu Pro Ala Pro
        275                 280                 285

Ser Arg Ala Arg Val Pro Arg Leu Pro Glu Gln Gly Ser Ser Ser Arg
    290                 295                 300

Ala Glu Asp Ser Pro Glu Gly Tyr Glu Lys Glu Gly Leu Gly Asp Arg
305                 310                 315                 320

Gly Glu Lys Pro Ala Ser Pro Ala Val Gln Pro Asp Ala Ala Leu Gln
                325                 330                 335

Arg Leu Ala Ala Val Leu Ala Gly Tyr Gly Val Glu Leu Arg Gln Leu
            340                 345                 350

Thr Pro Glu Gln Leu Ser Thr Leu Leu Thr Leu Leu Gln Leu Leu Pro
        355                 360                 365

Lys Gly Ala Gly Arg Asn Pro Gly Gly Val Val Asn Val Gly Ala Asp
    370                 375                 380
```

```
Ile Lys Lys Thr Met Glu Gly Pro Val Glu Gly Arg Asp Thr Ala Glu
385                 390                 395                 400

Leu Pro Ala Arg Thr Ser Pro Met Pro Gly His Pro Thr Ala Ser Pro
                405                 410                 415

Thr Ser Ser Glu Val Gln Gln Val Pro Ser Pro Val Ser Ser Glu Pro
            420                 425                 430

Pro Lys Ala Ala Arg Pro Pro Val Thr Pro Val Leu Leu Glu Lys Lys
        435                 440                 445

Ser Pro Leu Gly Gln Ser Gln Pro Thr Val Ala Gly Gln Pro Ser Ala
    450                 455                 460

Arg Pro Ala Ala Glu Glu Tyr Gly Tyr Ile Val Thr Asp Gln Lys Pro
465                 470                 475                 480

Leu Ser Leu Ala Ala Gly Val Lys Leu Leu Glu Ile Leu Ala Glu His
                485                 490                 495

Val His Met Ser Ser Gly Ser Phe Ile Asn Ile Ser Val Val Gly Pro
            500                 505                 510

Ala Leu Thr Phe Arg Ile Arg His Asn Glu Gln Asn Leu Ser Leu Ala
        515                 520                 525

Asp Val Thr Gln Gln Ala Gly Leu Val Lys Ser Glu Leu Glu Ala Gln
    530                 535                 540

Thr Gly Leu Gln Ile Leu Gln Thr Gly Val Gly Gln Arg Glu Glu Ala
545                 550                 555                 560

Ala Ala Val Leu Pro Gln Thr Ala His Ser Thr Ser Pro Met Arg Ser
                565                 570                 575

Val Leu Leu Thr Leu Val Ala Leu Ala Gly Val Ala Gly Leu Leu Val
            580                 585                 590

Ala Leu Ala Val Ala Leu Cys Val Arg Gln His Ala Arg Gln Gln Asp
        595                 600                 605

Lys Glu Arg Leu Ala Ala Leu Gly Pro Glu Gly Ala His Gly Asp Thr
    610                 615                 620

Thr Phe Glu Tyr Gln Asp Leu Cys Arg Gln His Met Ala Thr Lys Ser
625                 630                 635                 640
```

```
Leu Phe Asn Arg Ala Glu Gly Pro Pro Glu Pro Ser Arg Val Ser Ser
                645                 650                 655

Val Ser Ser Gln Phe Ser Asp Ala Ala Gln Ala Ser Pro Ser Ser His
            660                 665                 670

Ser Ser Thr Pro Ser Trp Cys Glu Glu Pro Ala Gln Ala Asn Met Asp
        675                 680                 685

Ile Ser Thr Gly His Met Ile Leu Ala Tyr Met Glu Asp His Leu Arg
    690                 695                 700

Asn Arg Asp Arg Leu Ala Lys Glu Trp Gln Ala Leu Cys Ala Tyr Gln
705                 710                 715                 720

Ala Glu Pro Asn Thr Cys Ala Thr Ala Gln Gly Glu Gly Asn Ile Lys
                725                 730                 735

Lys Asn Arg His Pro Asp Phe Leu Pro Tyr Asp His Ala Arg Ile Lys
            740                 745                 750

Leu Lys Val Glu Ser Ser Pro Ser Arg Ser Asp Tyr Ile Asn Ala Ser
        755                 760                 765

Pro Ile Ile Glu His Asp Pro Arg Met Pro Ala Tyr Ile Ala Thr Gln
    770                 775                 780

Gly Pro Leu Ser His Thr Ile Ala Asp Phe Trp Gln Met Val Trp Glu
785                 790                 795                 800

Ser Gly Cys Thr Val Ile Val Met Leu Thr Pro Leu Val Glu Asp Gly
                805                 810                 815

Val Lys Gln Cys Asp Arg Tyr Trp Pro Asp Glu Gly Ala Ser Leu Tyr
            820                 825                 830

His Val Tyr Glu Val Asn Leu Val Ser Glu His Ile Trp Cys Glu Asp
        835                 840                 845

Phe Leu Val Arg Ser Phe Tyr Leu Lys Asn Val Gln Thr Gln Glu Thr
    850                 855                 860

Arg Thr Leu Thr Gln Phe His Phe Leu Ser Trp Pro Ala Glu Gly Thr
865                 870                 875                 880

Pro Ala Ser Thr Arg Pro Leu Leu Asp Phe Arg Arg Lys Val Asn Lys
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885 890 895

Cys Tyr Arg Gly Arg Ser Cys Pro Ile Ile Val His Cys Ser Asp Gly
900 905 910

Ala Gly Arg Thr Gly Thr Tyr Ile Leu Ile Asp Met Val Leu Asn Arg
915 920 925

Met Ala Lys Gly Val Lys Glu Ile Asp Ile Ala Ala Thr Leu Glu His
930 935 940

Val Arg Asp Gln Arg Pro Gly Leu Val Arg Ser Lys Asp Gln Phe Glu
945 950 955 960

Phe Ala Leu Thr Ala Val Ala Glu Glu Val Asn Ala Ile Leu Lys Ala
965 970 975

Leu Pro Gln

<210> 2199
<211> 15
<212> PRT
<213> Mus musculus

<400> 2199

Ala Glu Leu Asn Gln Leu Arg Ala Lys Glu Pro Thr Lys Leu Ala
1 5 10 15

<210> 2200
<211> 15
<212> PRT
<213> Mus musculus

<400> 2200

Glu Leu Arg Glu Leu Arg Leu Arg Leu Asp Gln Leu Thr Ala Asn
1 5 10 15

<210> 2201
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2201

Glu Arg Gly Phe Phe Tyr Thr Pro Lys
1 5

<210> 2202
<211> 7
<212> PRT

<213> Mus musculus

<400> 2202

Gly Leu Ala Pro Ser Gly Ala
1 5

<210> 2203
<211> 10
<212> PRT
<213> Homo sapiens

<400> 2203

Leu Cys Gly Ser His Leu Val Glu Ala Leu
1 5 10

<210> 2204
<211> 10
<212> PRT
<213> Homo sapiens

<400> 2204

Leu Val Cys Gly Glu Arg Gly Phe Phe Tyr
1 5 10

<210> 2205
<211> 10
<212> PRT
<213> Homo sapiens

<400> 2205

Leu Tyr Leu Val Cys Gly Glu Arg Gly Phe
1 5 10

<210> 2206
<211> 15
<212> PRT
<213> Mus musculus

<400> 2206

Gln Val His Val Glu Met Asp Val Ala Lys Pro Asp Leu Thr Ala
1 5 10 15

<210> 2207
<211> 9
<212> PRT
<213> Mus musculus

<400> 2207

Trp Tyr Arg Ser Lys Phe Ala Asp Leu
1 5

<210> 2208
<211> 13
<212> PRT
<213> Bos taurus

<400> 2208

Phe Lys Ala Asp Glu Lys Lys Phe Trp Gly Lys Tyr Leu
1 5 10

<210> 2209
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2209

Gln Met Arg Pro Val Ser Arg Val Leu
1 5

<210> 2210
<211> 5
<212> PRT
<213> Bos taurus

<400> 2210

Ala Asp Glu Lys Lys
1 5

<210> 2211
<211> 16
<212> PRT
<213> Bos taurus

<400> 2211

Ala Asp Glu Lys Lys Phe Trp Gly Lys Tyr Leu Tyr Glu Ile Ala Arg
1 5 10 15

<210> 2212
<211> 5
<212> PRT
<213> Bos taurus

<400> 2212

Glu Phe Lys Ala Asp
1 5

<210> 2213
<211> 6
<212> PRT
<213> Bos taurus

<400> 2213

Glu Phe Lys Ala Asp Glu

1 5

<210> 2214
<211> 8
<212> PRT
<213> Bos taurus

<400> 2214

Glu Phe Lys Ala Asp Glu Lys Lys
1 5

<210> 2215
<211> 6
<212> PRT
<213> Bos taurus

<400> 2215

Phe Lys Ala Asp Glu Lys
1 5

<210> 2216
<211> 9
<212> PRT
<213> Simian immunodeficiency virus

<400> 2216

Phe Tyr Cys Lys Met Asn Trp Phe Leu
1 5

<210> 2217
<211> 9
<212> PRT
<213> Aquifex aeolicus

<400> 2217

Gly Phe Ile Lys Asn Phe Trp Phe Ile
1 5

<210> 2218
<211> 9
<212> PRT
<213> Helicobacter pylori

<400> 2218

Gly Tyr Asn Lys Ala Met Gly Phe Leu
1 5

<210> 2219
<211> 9
<212> PRT
<213> Helicobacter pylori

<400> 2219

Ile Phe Phe Lys Thr Ser Ser Phe Leu
1 5

<210> 2220
<211> 9
<212> PRT
<213> Saccharomyces cerevisiae

<400> 2220

Ile Tyr Gln Lys Ala Asn Thr Phe Leu
1 5

<210> 2221
<211> 9
<212> PRT
<213> Helicobacter pylori

<400> 2221

Ile Tyr Val Lys Thr Ser Ser Phe Leu
1 5

<210> 2222
<211> 6
<212> PRT
<213> Bos taurus

<400> 2222

Lys Ala Asp Glu Lys Lys
1 5

<210> 2223
<211> 9
<212> PRT
<213> Borrelia burgdorferi

<400> 2223

Lys Tyr Asn Lys Asn Gly Asn Phe Leu
1 5

<210> 2224
<211> 9
<212> PRT
<213> Haemophilus influenzae

<400> 2224

Lys Tyr Tyr Lys Asn Ser Gln Phe Leu
1 5

<210> 2225
<211> 9

<212> PRT
<213> Saccharomyces cerevisiae

<400> 2225

Lys Tyr Tyr Lys Thr Ser Asn Phe Leu
1 5

<210> 2226
<211> 18
<212> PRT
<213> Bos taurus

<400> 2226

Leu Pro Lys Leu Lys Pro Asp Pro Asn Thr Leu Cys Asp Glu Phe Lys
1 5 10 15

Ala Asp

<210> 2227
<211> 9
<212> PRT
<213> Borrelia burgdorferi 6

<400> 2227

Leu Tyr Ser Lys Asn Leu Val Phe Leu
1 5

<210> 2228
<211> 9
<212> PRT
<213> Methanothermobacter thermautotrophicus

<400> 2228

Asn Phe Met Lys Thr Ala Gly Phe Ile
1 5

<210> 2229
<211> 9
<212> PRT
<213> Rickettsia prowazekii

<400> 2229

Gln Tyr Asn Lys Thr Gly Tyr Phe Ile
1 5

<210> 2230
<211> 9
<212> PRT
<213> Langat virus

<400> 2230

Arg Phe Ser Lys Ala Leu Tyr Phe Leu
1 5

<210> 2231
<211> 9
<212> PRT
<213> Escherichia coli

<400> 2231

Arg Tyr Gln Lys Ala Gly Val Met Leu
1 5

<210> 2232
<211> 9
<212> PRT
<213> Aquifex aeolicus

<400> 2232

Thr Tyr Leu Lys Asn Ala Gln Phe Val
1 5

<210> 2233
<211> 9
<212> PRT
<213> Drosophila melanogaster

<400> 2233

Val Tyr Val Lys Thr Ser Ser Phe Ile
1 5

<210> 2234
<211> 9
<212> PRT
<213> Haemophilus influenzae

<400> 2234

Tyr Phe Leu Lys Cys Gly Tyr Phe Leu
1 5

<210> 2235
<211> 9
<212> PRT
<213> Sonchus yellow net virus

<400> 2235

Tyr Tyr Asn Lys Ala Leu Ser Phe Ile
1 5

<210> 2236
<211> 21
<212> PRT

<213> Homo sapiens

<400> 2236

His Gly Asp Thr Thr Phe Glu Tyr Gln Asp Leu Cys Arg Gln His Met
1 5 10 15

Ala Thr Lys Ser Leu
20

<210> 2237
<211> 21
<212> PRT
<213> Homo sapiens

<400> 2237

Arg Leu Ala Ala Leu Gly Pro Glu Gly Ala His Gly Asp Thr Thr Phe
1 5 10 15

Glu Tyr Gln Asp Leu
20

<210> 2238
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2238

Arg Gln His Ala Arg Gln Gln Asp Lys Glu Arg Leu Ala Ala Leu Gly
1 5 10 15

Pro Glu Gly Ala
20

<210> 2239
<211> 42
<212> PRT
<213> Homo sapiens

<400> 2239

Arg Gln His Ala Arg Gln Gln Asp Lys Glu Arg Leu Ala Ala Leu Gly
1 5 10 15

Pro Glu Gly Ala His Gly Asp Thr Thr Phe Glu Tyr Gln Asp Leu Cys
20 25 30

Arg Gln His Met Ala Thr Lys Ser Leu Phe
35 40

<210> 2240
<211> 16

<212> PRT
<213> Mus musculus

<400> 2240

Gln Cys Cys Thr Ser Ile Cys Ser Leu Tyr Gln Leu Glu Asn Tyr Cys
1 5 10 15

<210> 2241
<211> 12
<212> PRT
<213> Bos taurus

<400> 2241

Glu Asp Lys Gly Ala Cys Leu Leu Pro Lys Ile Glu
1 5 10

<210> 2242
<211> 30
<212> PRT
<213> Homo sapiens

<400> 2242

Phe Phe Arg Met Val Ile Ser Asn Pro Ala Ala Thr His Gln Asp Ile
1 5 10 15

Asp Phe Leu Ile Glu Glu Ile Glu Arg Leu Gly Gln Asp Leu
20 25 30

<210> 2243
<211> 41
<212> PRT
<213> Homo sapiens

<400> 2243

Gly Gly Ala Ile Ser Asn Met Tyr Ala Met Met Ile Ala Arg Phe Lys
1 5 10 15

Met Phe Pro Glu Val Lys Glu Lys Gly Met Ala Ala Leu Pro Arg Leu
20 25 30

Ile Ala Phe Thr Ser Glu His Ser His
35 40

<210> 2244
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2244

Leu Tyr Leu Val Cys Gly Glu Arg Leu
1 5

<210> 2245
<211> 17
<212> PRT
<213> Homo sapiens

<400> 2245

Asn Ile Ile Lys Asn Arg Glu Gly Tyr Glu Met Val Phe Asp Gly Lys
1 5 10 15

Pro

<210> 2246
<211> 4
<212> PRT
<213> Homo sapiens

<400> 2246

Pro Gly Gly Ser
1

<210> 2247
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2247

Val Ile Lys Ala Arg Met Met Glu Tyr
1 5

<210> 2248
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2248

Tyr Ala Ile Glu Asn Tyr Leu Glu Leu
1 5

<210> 2249
<211> 585
<212> PRT
<213> Homo sapiens

<400> 2249

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Met Ala Ser Pro Gly Ser Gly Phe Trp Ser Phe Gly Ser Glu Asp Gly
1               5                  10                  15

Ser Gly Asp Ser Glu Asn Pro Gly Thr Ala Arg Ala Trp Cys Gln Val
            20                  25                  30

Ala Gln Lys Phe Thr Gly Gly Ile Gly Asn Lys Leu Cys Ala Leu Leu
        35                  40                  45

Tyr Gly Asp Ala Glu Lys Pro Ala Glu Ser Gly Gly Ser Gln Pro Pro
    50                  55                  60

Arg Ala Ala Ala Arg Lys Ala Ala Cys Ala Cys Asp Gln Lys Pro Cys
65                  70                  75                  80

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

Leu Leu Pro Ala Cys Asp Gly Glu Arg Pro Thr Leu Ala Phe Leu Gln
            100                 105                 110

Asp Val Met Asn Ile Leu Leu Gln Tyr Val Val Lys Ser Phe Asp Arg
        115                 120                 125

Ser Thr Lys Val Ile Asp Phe His Tyr Pro Asn Glu Leu Leu Gln Glu
    130                 135                 140

Tyr Asn Trp Glu Leu Ala Asp Gln Pro Gln Asn Leu Glu Glu Ile Leu
145                 150                 155                 160

Met His Cys Gln Thr Thr Leu Lys Tyr Ala Ile Lys Thr Gly His Pro
                165                 170                 175

Arg Tyr Phe Asn Gln Leu Ser Thr Gly Leu Asp Met Val Gly Leu Ala
            180                 185                 190

Ala Asp Trp Leu Thr Ser Thr Ala Asn Thr Asn Met Phe Thr Tyr Glu
        195                 200                 205

Ile Ala Pro Val Phe Val Leu Leu Glu Tyr Val Thr Leu Lys Lys Met
    210                 215                 220

Arg Glu Ile Ile Gly Trp Pro Gly Gly Ser Gly Asp Gly Ile Phe Ser
225                 230                 235                 240

Pro Gly Gly Ala Ile Ser Asn Met Tyr Ala Met Met Ile Ala Arg Phe
                245                 250                 255
```

```
Lys Met Phe Pro Glu Val Lys Glu Lys Gly Met Ala Ala Leu Pro Arg
            260                 265                 270

Leu Ile Ala Phe Thr Ser Glu His Ser His Phe Ser Leu Lys Lys Gly
        275                 280                 285

Ala Ala Ala Leu Gly Ile Gly Thr Asp Ser Val Ile Leu Ile Lys Cys
    290                 295                 300

Asp Glu Arg Gly Lys Met Ile Pro Ser Asp Leu Glu Arg Arg Ile Leu
305                 310                 315                 320

Glu Ala Lys Gln Lys Gly Phe Val Pro Phe Leu Val Ser Ala Thr Ala
                325                 330                 335

Gly Thr Thr Val Tyr Gly Ala Phe Asp Pro Leu Leu Ala Val Ala Asp
            340                 345                 350

Ile Cys Lys Lys Tyr Lys Ile Trp Met His Val Asp Ala Ala Trp Gly
        355                 360                 365

Gly Gly Leu Leu Met Ser Arg Lys His Lys Trp Lys Leu Ser Gly Val
    370                 375                 380

Glu Arg Ala Asn Ser Val Thr Trp Asn Pro His Lys Met Met Gly Val
385                 390                 395                 400

Pro Leu Gln Cys Ser Ala Leu Leu Val Arg Glu Glu Gly Leu Met Gln
                405                 410                 415

Asn Cys Asn Gln Met His Ala Ser Tyr Leu Phe Gln Gln Asp Lys His
            420                 425                 430

Tyr Asp Leu Ser Tyr Asp Thr Gly Asp Lys Ala Leu Gln Cys Gly Arg
        435                 440                 445

His Val Asp Val Phe Lys Leu Trp Leu Met Trp Arg Ala Lys Gly Thr
    450                 455                 460

Thr Gly Phe Glu Ala His Val Asp Lys Cys Leu Glu Leu Ala Glu Tyr
465                 470                 475                 480

Leu Tyr Asn Ile Ile Lys Asn Arg Glu Gly Tyr Glu Met Val Phe Asp
                485                 490                 495

Gly Lys Pro Gln His Thr Asn Val Cys Phe Trp Tyr Ile Pro Pro Ser
            500                 505                 510
```

```
Leu Arg Thr Leu Glu Asp Asn Glu Glu Arg Met Ser Arg Leu Ser Lys
        515                 520                 525


Val Ala Pro Val Ile Lys Ala Arg Met Met Glu Tyr Gly Thr Thr Met
    530                 535                 540


Val Ser Tyr Gln Pro Leu Gly Asp Lys Val Asn Phe Phe Arg Met Val
545                 550                 555                 560


Ile Ser Asn Pro Ala Ala Thr His Gln Asp Ile Asp Phe Leu Ile Glu
                565                 570                 575


Glu Ile Glu Arg Leu Gly Gln Asp Leu
            580                 585


<210>  2250
<211>  12
<212>  PRT
<213>  Mus musculus

<400>  2250

Leu Tyr Phe Cys Ala Ala Arg Ser Asn Tyr Gln Leu
1               5                   10


<210>  2251
<211>  15
<212>  PRT
<213>  Homo sapiens

<400>  2251

Ala Tyr Val Leu Leu Ser Glu Lys Lys Ile Ser Ser Ile Gln Ser
1               5                   10                  15


<210>  2252
<211>  15
<212>  PRT
<213>  Homo sapiens

<400>  2252

Gly Glu Ala Leu Ser Thr Leu Val Leu Asn Arg Leu Lys Val Gly
1               5                   10                  15


<210>  2253
<211>  15
<212>  PRT
<213>  Mycobacterium

<400>  2253

Gly Glu Ala Leu Ser Thr Leu Val Val Asn Lys Ile Arg Gly Thr
```

1 5 10 15

<210> 2254
<211> 11
<212> PRT
<213> Homo sapiens

<400> 2254

Ala Leu Trp Gly Pro Asp Pro Ala Ala Ala Phe
1 5 10

<210> 2255
<211> 10
<212> PRT
<213> Homo sapiens

<400> 2255

Leu Ala Leu Trp Gly Pro Asp Pro Ala Ala
1 5 10

<210> 2256
<211> 11
<212> PRT
<213> Homo sapiens

<400> 2256

Arg Leu Leu Pro Leu Leu Ala Leu Leu Ala Leu
1 5 10

<210> 2257
<211> 42
<212> PRT
<213> Homo sapiens

<400> 2257

Ile Ala Ala Thr Leu Glu His Val Arg Asp Gln Arg Pro Gly Leu Val
1 5 10 15

Arg Ser Lys Asp Gln Phe Glu Phe Ala Leu Thr Ala Val Ala Glu Glu
20 25 30

Val Asn Ala Ile Leu Lys Ala Leu Pro Gln
35 40

<210> 2258
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2258

Asn Leu Ala Gln Asp Leu Ala Thr Val

1 5

<210> 2259
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2259

Gln Leu Ala Arg Gln Gln Val His Val
1 5

<210> 2260
<211> 979
<212> PRT
<213> Homo sapiens

<400> 2260

Met Arg Arg Pro Arg Arg Pro Gly Gly Leu Gly Gly Ser Gly Gly Leu
1 5 10 15

Arg Leu Leu Leu Cys Leu Leu Leu Leu Ser Ser Arg Pro Gly Gly Cys
20 25 30

Ser Ala Val Ser Ala His Gly Cys Leu Phe Asp Arg Arg Leu Cys Ser
35 40 45

His Leu Glu Val Cys Ile Gln Asp Gly Leu Phe Gly Gln Cys Gln Val
50 55 60

Gly Val Gly Gln Ala Arg Pro Leu Leu Gln Val Thr Ser Pro Val Leu
65 70 75 80

Gln Arg Leu Gln Gly Val Leu Arg Gln Leu Met Ser Gln Gly Leu Ser
85 90 95

Trp His Asp Asp Leu Thr Gln Tyr Val Ile Ser Gln Glu Met Glu Arg
100 105 110

Ile Pro Arg Leu Arg Pro Pro Glu Pro Arg Pro Arg Asp Arg Ser Gly
115 120 125

Leu Ala Pro Lys Arg Pro Gly Pro Ala Gly Glu Leu Leu Leu Gln Asp
130 135 140

Ile Pro Thr Gly Ser Ala Pro Ala Ala Gln His Arg Leu Pro Gln Pro
145 150 155 160

Pro Val Gly Lys Gly Gly Ala Gly Ala Ser Ser Ser Leu Ser Pro Leu
165 170 175

```
Gln Ala Glu Leu Leu Pro Pro Leu Leu Glu His Leu Leu Leu Pro Pro
            180                 185                 190

Gln Pro Pro His Pro Ser Leu Ser Tyr Glu Pro Ala Leu Leu Gln Pro
        195                 200                 205

Tyr Leu Phe His Gln Phe Gly Ser Arg Asp Gly Ser Arg Val Ser Glu
    210                 215                 220

Gly Ser Pro Gly Met Val Ser Val Gly Pro Leu Pro Lys Ala Glu Ala
225                 230                 235                 240

Pro Ala Leu Phe Ser Arg Thr Ala Ser Lys Gly Ile Phe Gly Asp His
                245                 250                 255

Pro Gly His Ser Tyr Gly Asp Leu Pro Gly Pro Ser Pro Ala Gln Leu
            260                 265                 270

Phe Gln Asp Ser Gly Leu Leu Tyr Leu Ala Gln Glu Leu Pro Ala Pro
        275                 280                 285

Ser Arg Ala Arg Val Pro Arg Leu Pro Glu Gln Gly Ser Ser Ser Arg
    290                 295                 300

Ala Glu Asp Ser Pro Glu Gly Tyr Glu Lys Glu Gly Leu Gly Asp Arg
305                 310                 315                 320

Gly Glu Lys Pro Ala Ser Pro Ala Val Gln Pro Asp Ala Ala Leu Gln
                325                 330                 335

Arg Leu Ala Ala Val Leu Ala Gly Tyr Gly Val Glu Leu Arg Gln Leu
            340                 345                 350

Thr Pro Glu Gln Leu Ser Thr Leu Leu Thr Leu Leu Gln Leu Leu Pro
        355                 360                 365

Lys Gly Ala Gly Arg Asn Pro Gly Gly Val Val Asn Val Gly Ala Asp
    370                 375                 380

Ile Lys Lys Thr Met Glu Gly Pro Val Glu Gly Arg Asp Thr Ala Glu
385                 390                 395                 400

Leu Pro Ala Arg Thr Ser Pro Met Pro Gly His Pro Thr Ala Ser Pro
                405                 410                 415

Thr Ser Ser Glu Val Gln Gln Val Pro Ser Pro Val Ser Ser Glu Pro
```

420 425 430

Pro Lys Ala Ala Arg Pro Pro Val Thr Pro Val Leu Leu Glu Lys Lys
435 440 445

Ser Pro Leu Gly Gln Ser Gln Pro Thr Val Ala Gly Gln Pro Ser Ala
450 455 460

Arg Pro Ala Ala Glu Glu Tyr Gly Tyr Ile Val Thr Asp Gln Lys Pro
465 470 475 480

Leu Ser Leu Ala Ala Gly Val Lys Leu Leu Glu Ile Leu Ala Glu His
485 490 495

Val His Met Ser Ser Gly Ser Phe Ile Asn Ile Ser Val Val Gly Pro
500 505 510

Ala Leu Thr Phe Arg Ile Arg His Asn Glu Gln Asn Leu Ser Leu Ala
515 520 525

Asp Val Thr Gln Gln Ala Gly Leu Val Lys Ser Glu Leu Glu Ala Gln
530 535 540

Thr Gly Leu Gln Ile Leu Gln Thr Gly Val Gly Gln Arg Glu Glu Ala
545 550 555 560

Ala Ala Val Leu Pro Gln Thr Ala His Ser Thr Ser Pro Met Arg Ser
565 570 575

Val Leu Leu Thr Leu Val Ala Leu Ala Gly Val Ala Gly Leu Leu Val
580 585 590

Ala Leu Ala Val Ala Leu Cys Val Arg Gln His Ala Arg Gln Gln Asp
595 600 605

Lys Glu Arg Leu Ala Ala Leu Gly Pro Glu Gly Ala His Gly Asp Thr
610 615 620

Thr Phe Glu Tyr Gln Asp Leu Cys Arg Gln His Met Ala Thr Lys Ser
625 630 635 640

Leu Phe Asn Arg Ala Glu Gly Pro Pro Glu Pro Ser Arg Val Ser Ser
645 650 655

Val Ser Ser Gln Phe Ser Asp Ala Ala Gln Ala Ser Pro Ser Ser His
660 665 670

```
Ser Ser Thr Pro Ser Trp Cys Glu Glu Pro Ala Gln Ala Asn Met Asp
        675                 680                 685

Ile Ser Thr Gly His Met Ile Leu Ala Tyr Met Glu Asp His Leu Arg
    690                 695                 700

Asn Arg Asp Arg Leu Ala Lys Glu Trp Gln Ala Leu Cys Ala Tyr Gln
705                 710                 715                 720

Ala Glu Pro Asn Thr Cys Ala Thr Ala Gln Gly Glu Gly Asn Ile Lys
                725                 730                 735

Lys Asn Arg His Pro Asp Phe Leu Pro Tyr Asp His Ala Arg Ile Lys
            740                 745                 750

Leu Lys Val Glu Ser Ser Pro Ser Arg Ser Asp Tyr Ile Asn Ala Ser
        755                 760                 765

Pro Ile Ile Glu His Asp Pro Arg Met Pro Ala Tyr Ile Ala Thr Gln
    770                 775                 780

Gly Pro Leu Ser His Thr Ile Ala Asp Phe Trp Gln Met Val Trp Glu
785                 790                 795                 800

Ser Gly Cys Thr Val Ile Val Met Leu Thr Pro Leu Val Glu Asp Gly
                805                 810                 815

Val Lys Gln Cys Asp Arg Tyr Trp Pro Asp Glu Gly Ala Ser Leu Tyr
            820                 825                 830

His Val Tyr Glu Val Asn Leu Val Ser Glu His Ile Trp Cys Glu Asp
        835                 840                 845

Phe Leu Val Arg Ser Phe Tyr Leu Lys Asn Val Gln Thr Gln Glu Thr
    850                 855                 860

Arg Thr Leu Thr Gln Phe His Phe Leu Ser Trp Pro Ala Glu Gly Thr
865                 870                 875                 880

Pro Ala Ser Thr Arg Pro Leu Leu Asp Phe Arg Arg Lys Val Asn Lys
                885                 890                 895

Cys Tyr Arg Gly Arg Ser Cys Pro Ile Ile Val His Cys Ser Asp Gly
            900                 905                 910

Ala Gly Arg Thr Gly Thr Tyr Ile Leu Ile Asp Met Val Leu Asn Arg
        915                 920                 925
```

Met Ala Lys Gly Val Lys Glu Ile Asp Ile Ala Ala Thr Leu Glu His
    930   935   940

Val Arg Asp Gln Arg Pro Gly Leu Val Arg Ser Lys Asp Gln Phe Glu
945   950   955   960

Phe Ala Leu Thr Ala Val Ala Glu Glu Val Asn Ala Ile Leu Lys Ala
                965   970   975

Leu Pro Gln

<210> 2261
<211> 12
<212> PRT
<213> Human coxsackievirus

<400> 2261

Glu Trp Leu Lys Val Lys Ile Leu Pro Glu Val Lys
1   5   10

<210> 2262
<211> 20
<212> PRT
<213> Enterovirus A

<400> 2262

Trp Leu Lys Val Lys Ile Leu Pro Glu Val Lys Glu Lys His Glu Phe
1   5   10   15

Leu Asn Arg Leu
            20

<210> 2263
<211> 15
<212> PRT
<213> Human Endogenous Retrovirus

<400> 2263

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

<210> 2264
<211> 23
<212> PRT
<213> Homo sapiens

<400> 2264

Ala Arg Phe Lys Met Phe Pro Glu Val Lys Glu Lys Gly Met Ala Ala
1   5   10   15

Leu Pro Arg Leu Ile Ala Phe
20

<210> 2265
<211> 23
<212> PRT
<213> Human coxsackievirus

<400> 2265

Leu Lys Val Lys Ile Leu Pro Glu Val Lys Glu Lys His Glu Phe Leu
1 5 10 15

Ser Arg Leu Lys Gln Leu Pro
20

<210> 2266
<211> 10
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2266

Ser Leu Tyr Gln Leu Glu Asn Tyr Cys Ala
1 5 10

<210> 2267
<211> 13
<212> PRT
<213> Mus musculus

<400> 2267

Tyr Lys Met Phe Pro Glu Val Lys Glu Lys Gly Met Ala
1 5 10

<210> 2268
<211> 13
<212> PRT
<213> Mus musculus

<400> 2268

Tyr Lys Tyr Phe Pro Glu Val Lys Thr Lys Gly Met Ala
1 5 10

<210> 2269
<211> 9
<212> PRT
<213> Unknown

<220>

<223> epitope involved in diabetes

<400> 2269

Ala Arg Lys Val Lys Gly Ala Ala Gly
1 5

<210> 2270
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2270

Ala Arg Leu Ser Val Val Arg Asn Gly
1 5

<210> 2271
<211> 21
<212> PRT
<213> Homo sapiens

<400> 2271

Asp Lys Val Asn Phe Phe Arg Met Val Ile Ser Asn Pro Ala Ala Thr
1 5 10 15

His Gln Asp Ile Asp
20

<210> 2272
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2272

Phe Arg Lys Ala Asp Lys Phe Pro Met
1 5

<210> 2273
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2273

Phe Arg Lys Thr Ser Ile Ser Gly Ala
1 5

<210> 2274
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2274

Phe Arg Lys Thr Ser Lys Gly Gly Ser
1 5

<210> 2275
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2275

Gly Gly Thr Thr Thr Pro Arg Thr Thr
1 5

<210> 2276
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2276

Gly Arg Lys Ser Ala Val Ser Pro Ala
1 5

<210> 2277
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2277

His Lys Lys Ser Leu Ser Ser Pro Ser
1 5

<210> 2278
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2278

His Arg Lys Ser Thr Val Ala Gly Ser
1   5

<210> 2279
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2279

Lys Gly Lys Lys Ala Leu Gln Ser Ala
1   5

<210> 2280
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2280

Lys Lys Lys Lys Tyr Ala Glu Ala Val
1   5

<210> 2281
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2281

Lys Lys Thr Lys Gly Leu Val Thr Thr
1   5

<210> 2282
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2282

Lys Arg Arg Ala Ser Ala Gly Gly Pro
1   5

<210> 2283
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2283

Lys Ser Val Lys Pro Arg Gln Ala Thr
1 5

<210> 2284
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2284

Leu Arg Lys Lys Gly Tyr Asp Pro Gly
1 5

<210> 2285
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2285

Leu Ser Arg Lys Lys Thr Leu Thr Thr
1 5

<210> 2286
<211> 13
<212> PRT
<213> Homo sapiens

<400> 2286

Met Phe Pro Glu Val Lys Glu Lys Gly Met Ala Ala Leu
1 5 10

<210> 2287
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2287

Met Arg Lys Ala Asn Ser Pro Pro Thr
1 5

<210> 2288
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2288

Met Arg Lys Ser Thr Gly Thr Ala Ser
1 5

<210> 2289
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2289

Asn Arg Lys Leu Lys Ser Asn Met Met
1 5

<210> 2290
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2290

Asn Arg Arg Leu Leu Pro Met Pro Glu
1 5

<210> 2291
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2291

Gln Lys Lys Met Val Ala Leu Ser Gly
1 5

<210> 2292

<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2292

Gln Lys Arg Ala Lys Gly Leu Ser Ala
1 5

<210> 2293
<211> 9
<212> PRT
<213> Unknown

<220>
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<400> 2293

Arg Gly Leu Lys Ser Lys Ile Ala Met
1 5

<210> 2294
<211> 9
<212> PRT
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<220>
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<400> 2294

Arg Lys Lys Lys Pro Pro Gly Leu Ala
1 5

<210> 2295
<211> 9
<212> PRT
<213> Unknown

<220>
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<400> 2295

Arg Lys Leu Ala His Pro Gly Thr Ser
1 5

<210> 2296
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2296

Arg Lys Arg Thr Arg His Leu Glu Gly
1 5

<210> 2297
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2297

Arg Lys Thr Ala Leu Gly Thr Arg Gln
1 5

<210> 2298
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<213> Unknown

<220>
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<400> 2298

Arg Lys Val Val Gln Thr Ser Leu Glu
1 5

<210> 2299
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<212> PRT
<213> Unknown

<220>
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<400> 2299

Arg Arg Lys Leu Arg Thr Asn Ala Gly
1 5

<210> 2300
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<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2300

Arg Arg Lys Pro Gly Thr Glu Gln Leu
1 5

<210> 2301

<211> 9
<212> PRT
<213> Unknown

<220>
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<400> 2301

Arg Ser Leu Lys Thr Lys Leu Pro Ser
1 5

<210> 2302
<211> 9
<212> PRT
<213> Unknown

<220>
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<400> 2302

Ser Arg Lys Ala Thr Ala Ser Leu Pro
1 5

<210> 2303
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2303

Ser Arg Lys Lys Thr Phe Thr Gly Ala
1 5

<210> 2304
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2304

Ser Arg Lys Ser Gly Ser Leu Thr Lys
1 5

<210> 2305
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2305

Ser Arg Lys Val Ala Leu Gln Gly Gly
1 5

<210> 2306
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2306

Thr Lys Leu Ser Asn Thr Pro Ser Pro
1 5

<210> 2307
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2307

Thr Gln Asp Leu Gly Tyr Ser Arg Val
1 5

<210> 2308
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2308

Thr Arg Gly Leu Lys Gly Ala Pro Gln
1 5

<210> 2309
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2309

Thr Arg Lys Ala Leu Thr Gln Asn Thr
1 5

<210> 2310

<211> 20
<212> PRT
<213> Homo sapiens

<400> 2310

Val Phe Asp Gly Lys Pro Gln His Thr Asn Val Cys Phe Trp Tyr Ile
1 5 10 15

Pro Pro Ser Leu
20

<210> 2311
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2311

Val Asn Phe Phe Arg Met Val Ile Ser Asn Pro Ala Ala Thr His Gln
1 5 10 15

Asp Ile Asp Phe
20

<210> 2312
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2312

Val Arg Lys Leu Thr Val Thr Ser Ala
1 5

<210> 2313
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2313

Tyr Lys Lys Gly Ala Arg Pro Ile Gln
1 5

<210> 2314
<211> 9
<212> PRT
<213> Unknown

<220>

<223> epitope involved in diabetes

<400> 2314

Tyr Arg Lys Lys Ser Ser Ala Glu Leu
1 5

<210> 2315
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2315

Tyr Arg Lys Thr Ala Lys Glu Gly Thr
1 5

<210> 2316
<211> 29
<212> PRT
<213> Rubella virus

<400> 2316

Glu Ala Cys Val Thr Ser Trp Leu Trp Ser Glu Gly Glu Gly Ala Val
1 5 10 15

Phe Tyr Arg Val Asp Leu His Phe Ile Asn Leu Gly Thr
20 25

<210> 2317
<211> 21
<212> PRT
<213> Rubella virus

<400> 2317

Met Asp Phe Trp Cys Val Glu His Asp Arg Pro Pro Pro Ala Thr Pro
1 5 10 15

Thr Ser Leu Thr Thr
20

<210> 2318
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2318

Asn Met Phe Thr Tyr Glu Ile Ala Pro Val Phe Val Leu Met Glu
1 5 10 15

<210> 2319
<211> 25
<212> PRT
<213> Rubella virus

<400> 2319

Pro Phe Leu Gly His Asp Gly His His Gly Gly Thr Leu Arg Val Gly
1 5 10 15

Gln His His Arg Asn Ala Ser Asp Val
20 25

<210> 2320
<211> 21
<212> PRT
<213> Rubella virus

<400> 2320

Arg Val Lys Phe His Thr Glu Thr Arg Thr Val Trp Gln Leu Ser Val
1 5 10 15

Ala Gly Val Ser Cys
20

<210> 2321
<211> 16
<212> PRT
<213> Human coxsackievirus

<400> 2321

Lys Ile Leu Pro Glu Val Lys Glu Lys His Glu Phe Leu Ser Arg Leu
1 5 10 15

<210> 2322
<211> 17
<212> PRT
<213> Homo sapiens

<400> 2322

Lys Met Phe Pro Glu Val Lys Glu Lys Gly Met Ala Ala Leu Pro Arg
1 5 10 15

Leu

<210> 2323
<211> 17
<212> PRT
<213> Homo sapiens

<400> 2323

Lys Tyr Phe Pro Glu Val Lys Thr Lys Gly Met Ala Ala Val Pro Lys
1   5   10   15

Leu

<210> 2324
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2324

Lys Arg Ser Arg Leu Asp Val
1   5

<210> 2325
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2325

Leu Gly Arg Gly Gly Ser Lys
1   5

<210> 2326
<211> 7
<212> PRT
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<220>
<223> epitope involved in diabetes

<400> 2326

Arg Leu Gly Lys Arg Asp Ser
1   5

<210> 2327
<211> 7
<212> PRT
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<220>
<223> epitope involved in diabetes

<400> 2327

Arg Gln Leu Gly Arg Gly Ser
1   5

<210> 2328
<211> 7
<212> PRT
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<220>
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<400> 2328

Ser Thr Val Gln Asp Cys Val
1 5

<210> 2329
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2329

Tyr Leu Gly Arg Gly Asp Lys
1 5

<210> 2330
<211> 12
<212> PRT
<213> Photobacterium phosphoreum

<400> 2330

Ala Lys Val Ala Ile Val Ile Ala Arg Phe Asn Ser
1 5 10

<210> 2331
<211> 12
<212> PRT
<213> Human herpesvirus

<400> 2331

Gly Gly Val Ala Val Val Ile Gly Arg Phe Phe Gly
1 5 10

<210> 2332
<211> 12
<212> PRT
<213> Synechocystis sp.

<400> 2332

Ser Ala Ile Gly Ile Tyr Leu Gly Arg Phe Leu Arg
1 5 10

<210> 2333

<211> 10
<212> PRT
<213> Mus musculus

<400> 2333

His Leu Cys Gly Pro His Leu Val Glu Ala
1 5 10

<210> 2334
<211> 9
<212> PRT
<213> Mus musculus

<400> 2334

Ile Val Asp Gln Cys Cys Thr Ser Ile
1 5

<210> 2335
<211> 9
<212> PRT
<213> Mus musculus

<400> 2335

Leu Leu Val His Phe Leu Pro Leu Leu
1 5

<210> 2336
<211> 13
<212> PRT
<213> Streptococcus pneumoniae

<400> 2336

Asp Asp Ile Met Met Ser Tyr Ala Ala Lys Gly Phe Val
1 5 10

<210> 2337
<211> 13
<212> PRT
<213> Rickettsia prowazekii

<400> 2337

Glu Leu Val Leu Met Ser Tyr Arg Asp Lys Leu Val Leu
1 5 10

<210> 2338
<211> 13
<212> PRT
<213> Human herpesvirus

<400> 2338

Lys Glu Leu Leu Gln Ser Tyr Val Ser Lys Asn Asn Asn
1 5 10

<210> 2339
<211> 13
<212> PRT
<213> Legionella pneumophila

<400> 2339

Lys Met Ser Leu Leu Gln Tyr Ile Val Lys Asn Lys Ile
1 5 10

<210> 2340
<211> 13
<212> PRT
<213> Lactococcus lactis

<400> 2340

Leu Val Ile Leu Pro Met Phe His Val Ser Gly Leu Ser
1 5 10

<210> 2341
<211> 13
<212> PRT
<213> Homo sapiens

<400> 2341

Pro Ile Ile Leu Pro Leu Trp His Val Gly Glu Pro Gly
1 5 10

<210> 2342
<211> 13
<212> PRT
<213> Homo sapiens

<400> 2342

Pro Ile Ile Leu Pro Leu Trp His Val Gly Met Asn Asp
1 5 10

<210> 2343
<211> 13
<212> PRT
<213> Neisseria meningitidis

<400> 2343

Pro Val Ile Leu Pro Gln Trp Gln Ser Leu Gly Asn Arg
1 5 10

<210> 2344
<211> 13
<212> PRT
<213> Staphylococcus aureus

<400> 2344

Pro Tyr Val Leu Leu Ala Tyr Ile Val Lys Ser Val Gly
1 5 10

<210> 2345
<211> 13
<212> PRT
<213> Chlamydia pneumoniae

<400> 2345

Gln Ala Met Asn Ile Leu Tyr Gln Thr Val Gln Ala Phe
1 5 10

<210> 2346
<211> 13
<212> PRT
<213> Streptococcus pyogenes

<400> 2346

Arg Glu Ile Leu Pro Gln Tyr Gln Leu Val Ile Leu Ala
1 5 10

<210> 2347
<211> 13
<212> PRT
<213> Homo sapiens

<400> 2347

Thr Thr Leu Leu Pro Gln Trp Arg Val Ser Ala Phe Val
1 5 10

<210> 2348
<211> 12
<212> PRT
<213> Homo sapiens

<400> 2348

Ala Tyr Ala Lys Asp Val Lys Phe Gly Ala Asp Ala
1 5 10

<210> 2349
<211> 13
<212> PRT
<213> Mus musculus

<400> 2349

Leu Ser Lys Val Ala Pro Val Ile Lys Ala Arg Met Met
1 5 10

<210> 2350
<211> 10
<212> PRT

<213> Unknown

<220>
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<400> 2350

Ser Arg Leu Gly Leu Trp Val Arg Met Glu
1 5 10

<210> 2351
<211> 14
<212> PRT
<213> Mus musculus

<400> 2351

Trp Ser Arg Met Asp Gln Leu Ala Lys Glu Leu Thr Ala Glu
1 5 10

<210> 2352
<211> 18
<212> PRT
<213> Mus musculus

<400> 2352

Phe Leu Pro Leu Leu Ala Leu Leu Ala Leu Trp Glu Pro Lys Pro Thr
1 5 10 15

Gln Ala

<210> 2353
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2353

Gly Gly Gly Pro Gly Ala Gly Ser Leu Gln Pro Leu Ala Leu Glu Gly
1 5 10 15

Ser Leu Gln Lys
20

<210> 2354
<211> 24
<212> PRT
<213> Homo sapiens

<400> 2354

Lys Leu Lys Val Glu Ser Ser Pro Ser Arg Ser Asp Tyr Ile Asn Ala
1 5 10 15

Ser Pro Ile Ile Glu His Asp Pro
20

<210> 2355
<211> 28
<212> PRT
<213> Homo sapiens

<400> 2355

Leu Ala Lys Glu Trp Gln Ala Leu Cys Ala Tyr Gln Ala Glu Pro Asn
1 5 10 15

Thr Cys Ala Thr Ala Gln Gly Glu Gly Asn Ile Lys
20 25

<210> 2356
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2356

Ser Phe Tyr Leu Lys Asn Val Gln Thr Gln Glu Thr Arg Thr Leu Thr
1 5 10 15

Gln Phe His Phe
20

<210> 2357
<211> 22
<212> PRT
<213> Homo sapiens

<400> 2357

Ser Lys Asp Gln Phe Glu Phe Ala Leu Thr Ala Val Ala Glu Glu Val
1 5 10 15

Asn Ala Ile Leu Lys Ala
20

<210> 2358
<211> 29
<212> PRT
<213> Homo sapiens

<400> 2358

Ser Arg Val Ser Ser Val Ser Ser Gln Phe Ser Asp Ala Ala Gln Ala
1 5 10 15

Ser Pro Ser Ser His Ser Ser Thr Pro Ser Trp Cys Glu
20 25

<210> 2359
<211> 12
<212> PRT
<213> Homo sapiens

<400> 2359

Ala Phe Leu Gln Asp Val Met Asn Ile Leu Leu Gln
1 5 10

<210> 2360
<211> 19
<212> PRT
<213> Homo sapiens

<400> 2360

Ala Leu Leu Arg Cys Ile Pro Ala Leu Asp Ser Leu Thr Pro Ala Asn
1 5 10 15

Glu Asp Cys

<210> 2361
<211> 12
<212> PRT
<213> Homo sapiens

<400> 2361

Ala Pro Lys Arg Pro Gly Pro Ala Gly Glu Leu Leu
1 5 10

<210> 2362
<211> 12
<212> PRT
<213> Human coxsackievirus

<400> 2362

Ala Thr Cys Arg Phe Tyr Thr Leu Asp Ser Ile Lys
1 5 10

<210> 2363
<211> 12
<212> PRT
<213> Human coxsackievirus

<400> 2363

Asp Ile Asn Thr Val Thr Thr Val Ala Gln Ser Arg
1 5 10

<210> 2364
<211> 12
<212> PRT

<213> Human coxsackievirus

<400> 2364

Asp Arg Val Arg Ser Ile Thr Leu Gly Asn Ser Thr
1 5 10

<210> 2365
<211> 12
<212> PRT
<213> Homo sapiens

<400> 2365

Glu Glu Ile Ala Gln Val Ala Thr Ile Ser Ala Asn
1 5 10

<210> 2366
<211> 12
<212> PRT
<213> Human coxsackievirus

<400> 2366

Glu Thr Ser Leu Ser Ala Ala Gly Asn Ser Ile Ile
1 5 10

<210> 2367
<211> 12
<212> PRT
<213> Homo sapiens

<400> 2367

Phe Phe Arg Met Val Ile Ser Asn Pro Ala Ala Thr
1 5 10

<210> 2368
<211> 12
<212> PRT
<213> Homo sapiens

<400> 2368

Gly Ala Asp Ile Lys Lys Thr Met Glu Gly Pro Val
1 5 10

<210> 2369
<211> 12
<212> PRT
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<400> 2369

Gly Val Glu Leu Arg Gln Leu Thr Pro Glu Gln Leu
1 5 10

<210> 2370
<211> 12
<212> PRT
<213> Homo sapiens

<400> 2370

Lys Asp Val Lys Phe Gly Ala Asp Ala Arg Ala Leu
1 5 10

<210> 2371
<211> 16
<212> PRT
<213> Homo sapiens

<400> 2371

Lys Glu Gln Phe Glu Phe Ala Leu Thr Ala Val Ala Glu Glu Val Cys
1 5 10 15

<210> 2372
<211> 12
<212> PRT
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<400> 2372

Lys Phe Gly Ala Asp Ala Arg Ala Leu Met Leu Gln
1 5 10

<210> 2373
<211> 12
<212> PRT
<213> Homo sapiens

<400> 2373

Lys Thr Gly His Pro Arg Tyr Phe Asn Gln Leu Ser
1 5 10

<210> 2374
<211> 12
<212> PRT
<213> Human coxsackievirus

<400> 2374

Leu Leu Glu Ser Gln Ile Ala Thr Ile Glu Gln Thr
1 5 10

<210> 2375
<211> 12
<212> PRT
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<400> 2375

Leu Leu Gln Tyr Val Val Lys Ser Phe Asp Arg Ser

1 5 10

<210> 2376
<211> 12
<212> PRT
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<400> 2376

Leu Arg Leu Leu Leu Cys Leu Leu Leu Leu Ser Ser
1 5 10

<210> 2377
<211> 12
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<400> 2377

Leu Arg Gln Leu Thr Pro Glu Gln Leu Ser Thr Leu
1 5 10

<210> 2378
<211> 12
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<400> 2378

Leu Thr Ala Val Glu Thr Gly His Thr Ser Gln Val
1 5 10

<210> 2379
<211> 12
<212> PRT
<213> Homo sapiens

<400> 2379

Leu Thr Arg Ala Tyr Ala Lys Asp Val Lys Phe Gly
1 5 10

<210> 2380
<211> 12
<212> PRT
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<400> 2380

Pro Pro Glu Pro Arg Pro Arg Asp Arg Ser Gly Leu
1 5 10

<210> 2381
<211> 12
<212> PRT
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<400> 2381

Pro Arg Pro Arg Asp Arg Ser Gly Leu Ala Pro Lys
1 5 10

<210> 2382
<211> 12
<212> PRT
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<400> 2382

Pro Ser Asn Ser Ala Ser Val Pro Ala Leu Thr Ala
1 5 10

<210> 2383
<211> 12
<212> PRT
<213> Homo sapiens

<400> 2383

Pro Thr Leu Ala Phe Leu Gln Asp Val Met Asn Ile
1 5 10

<210> 2384
<211> 23
<212> PRT
<213> Human coxsackievirus

<400> 2384

Pro Val Lys Asp Val Met Ile Lys Ser Leu Pro Ala Pro Ala Leu Asn
1 5 10 15

Ser Pro Thr Val Glu Glu Cys
20

<210> 2385
<211> 12
<212> PRT
<213> Homo sapiens

<400> 2385

Arg Asp Arg Ser Gly Leu Ala Pro Lys Arg Pro Gly
1 5 10

<210> 2386
<211> 12
<212> PRT
<213> Homo sapiens

<400> 2386

Arg Leu Arg Pro Pro Glu Pro Arg Pro Arg Asp Arg
1 5 10

<210> 2387
<211> 12
<212> PRT
<213> Human coxsackievirus

<400> 2387

Arg Ser Gly Pro Ser Asn Ser Ala Ser Val Pro Ala
1 5 10

<210> 2388
<211> 12
<212> PRT
<213> Human coxsackievirus

<400> 2388

Arg Ser Ile Thr Leu Gly Asn Ser Thr Ile Thr Thr
1 5 10

<210> 2389
<211> 12
<212> PRT
<213> Homo sapiens

<400> 2389

Arg Thr Ala Leu Leu Asp Ala Ala Gly Val Ala Ser
1 5 10

<210> 2390
<211> 12
<212> PRT
<213> Human coxsackievirus

<400> 2390

Ser Ala Ser Val Pro Ala Leu Thr Ala Val Glu Thr
1 5 10

<210> 2391
<211> 12
<212> PRT
<213> Homo sapiens

<400> 2391

Ser Gly Gly Leu Arg Leu Leu Leu Cys Leu Leu Leu
1 5 10

<210> 2392
<211> 12
<212> PRT
<213> Homo sapiens

<400> 2392

Ser Gly Leu Ala Pro Lys Arg Pro Gly Pro Ala Gly
1 5 10

<210> 2393
<211> 12
<212> PRT
<213> Human coxsackievirus

<400> 2393

Ser Leu Glu Lys Lys Met Ser Asn Tyr Ile Gln Phe
1 5 10

<210> 2394
<211> 12
<212> PRT
<213> Human coxsackievirus

<400> 2394

Ser Gln Ile Ala Thr Ile Glu Gln Thr Ala Pro Ser
1 5 10

<210> 2395
<211> 12
<212> PRT
<213> Human coxsackievirus

<400> 2395

Thr Lys Gln Met Val Gln Met Arg Arg Lys Leu Glu
1 5 10

<210> 2396
<211> 12
<212> PRT
<213> Human coxsackievirus

<400> 2396

Thr Arg Lys Asp Ile Asn Thr Val Thr Thr Val Ala
1 5 10

<210> 2397
<211> 12
<212> PRT
<213> Human coxsackievirus

<400> 2397

Val Glu Thr Gly His Thr Ser Gln Val Thr Pro Ser
1 5 10

<210> 2398
<211> 12
<212> PRT

<213> Homo sapiens

<400> 2398

Val Lys Glu Lys Gly Met Ala Ala Leu Pro Arg Leu
1 5 10

<210> 2399
<211> 17
<212> PRT
<213> Human coxsackievirus

<400> 2399

Val Met Ile Lys Ser Leu Pro Ala Leu Asn Ser Pro Thr Val Glu Glu
1 5 10 15

Cys

<210> 2400
<211> 12
<212> PRT
<213> Human coxsackievirus

<400> 2400

Val Pro Ala Leu Thr Ala Val Glu Thr Gly His Thr
1 5 10

<210> 2401
<211> 14
<212> PRT
<213> Mus musculus

<400> 2401

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

<210> 2402
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2402

Asp Val Met Asn Ile Leu Leu Gln Tyr Val Val Lys Ser Phe Asp Arg
1 5 10 15

Ser Thr Lys Val
20

<210> 2403
<211> 20
<212> PRT

<213> Homo sapiens

<400> 2403

Gly Ala Gly Ser Leu Gln Pro Leu Ala Leu Glu Gly Ser Leu Gln Lys
1 5 10 15

Arg Gly Ile Val
20

<210> 2404
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2404

Lys Asp Tyr Arg Ala Tyr Tyr Thr Phe Leu Asn Phe Met Ser Asn Val
1 5 10 15

Gly Asp Pro Arg
20

<210> 2405
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2405

Lys Val Asn Phe Phe Arg Met Val Ile Ser Asn Pro Ala Ala Thr His
1 5 10 15

Gln Asp Ile Asp
20

<210> 2406
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2406

Leu Ile Ala Phe Thr Ser Glu His Ser His Phe Ser Leu Lys Lys Gly
1 5 10 15

Ala Ala Ala Leu
20

<210> 2407
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2407

Arg Leu Gln Gln Leu Val Leu Asp Pro Gly Phe Leu Gly Leu Glu Pro
1 5 10 15

Leu Leu Asp Leu
20

<210> 2408
<211> 20
<212> PRT
<213> Porphyromonas gingivalis

<400> 2408

Thr Leu Val Val Asn Arg Leu Arg Gly Ser Leu Lys Ile Cys Ala Val
1 5 10 15

Lys Ala Pro Gly
20

<210> 2409
<211> 11
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2409

Ala His His Pro Ile Trp Ala Arg Met Asp Ala
1 5 10

<210> 2410
<211> 14
<212> PRT
<213> Mus musculus

<400> 2410

Asp Thr Lys Val Met Lys Cys Val Leu Glu Val Ile Ser Asp
1 5 10

<210> 2411
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2411

Asp Ser Val Ile Leu Ile Lys Cys Asp Glu Arg Gly Lys Met Ile Pro
1 5 10 15

Ser Asp Leu Glu
20

<210> 2412
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2412

His Lys Trp Lys Leu Ser Gly Val Glu Arg Ala Asn Ser Val Thr Trp
1 5 10 15

Asn Pro His Lys
20

<210> 2413
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2413

Lys Cys Leu Glu Leu Ala Glu Tyr Leu Tyr Asn Ile Ile Lys Asn Arg
1 5 10 15

Glu Gly Tyr Glu
20

<210> 2414
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2414

Lys Gly Met Ala Ala Leu Pro Arg Leu Ile Ala Phe Thr Ser Glu His
1 5 10 15

Ser His Phe Ser
20

<210> 2415
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2415

Arg Pro Thr Leu Ala Phe Leu Gln Asp Val Met Asn Ile Leu Leu Gln
1 5 10 15

Tyr Val Val Lys
20

<210> 2416
<211> 20

<212> PRT
<213> Homo sapiens

<400> 2416

Tyr Asp Leu Ser Tyr Asp Thr Gly Asp Lys Ala Leu Gln Cys Gly Arg
1 5 10 15

His Val Asp Val
20

<210> 2417
<211> 13
<212> PRT
<213> Homo sapiens

<400> 2417

Ile Pro Ala Leu Asp Ser Leu Thr Pro Ala Asn Glu Asp
1 5 10

<210> 2418
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2418

Pro Thr Ile Ala Phe Leu Gln Asp Val Met Asn Ile Leu Leu Gln Tyr
1 5 10 15

Val Val Lys Ser
20

<210> 2419
<211> 15
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2419

Ser His Leu Val Glu Ala Leu Tyr Leu Val Cys Gly Glu Glu Gly
1 5 10 15

<210> 2420
<211> 15
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2420

Ser His Leu Val Glu Ala Leu Tyr Leu Val Cys Gly Gly Glu Gly
1 5 10 15

<210> 2421
<211> 369
<212> PRT
<213> Homo sapiens

<400> 2421

Met Glu Phe Leu Glu Arg Thr Tyr Leu Val Asn Asp Lys Ala Ala Lys
1 5 10 15

Met Tyr Ala Phe Thr Leu Glu Ser Val Glu Leu Gln Gln Lys Pro Val
20 25 30

Asn Lys Asp Gln Cys Pro Arg Glu Arg Pro Glu Glu Leu Glu Ser Gly
35 40 45

Gly Met Tyr His Cys His Ser Gly Ser Lys Pro Thr Glu Lys Gly Ala
50 55 60

Asn Glu Tyr Ala Tyr Ala Lys Trp Lys Leu Cys Ser Ala Ser Ala Ile
65 70 75 80

Cys Phe Ile Phe Met Ile Ala Glu Val Val Gly Gly His Ile Ala Gly
85 90 95

Ser Leu Ala Val Val Thr Asp Ala Ala His Leu Leu Ile Asp Leu Thr
100 105 110

Ser Phe Leu Leu Ser Leu Phe Ser Leu Trp Leu Ser Ser Lys Pro Pro
115 120 125

Ser Lys Arg Leu Thr Phe Gly Trp His Arg Ala Glu Ile Leu Gly Ala
130 135 140

Leu Leu Ser Ile Leu Cys Ile Trp Val Val Thr Gly Val Leu Val Tyr
145 150 155 160

Leu Ala Cys Glu Arg Leu Leu Tyr Pro Asp Tyr Gln Ile Gln Ala Thr
165 170 175

Val Met Ile Ile Val Ser Ser Cys Ala Val Ala Ala Asn Ile Val Leu
180 185 190

Thr Val Val Leu His Gln Arg Cys Leu Gly His Asn His Lys Glu Val
195 200 205

```
Gln Ala Asn Ala Ser Val Arg Ala Ala Phe Val His Ala Leu Gly Asp
    210                 215                 220

Leu Phe Gln Ser Ile Ser Val Leu Ile Ser Ala Leu Ile Ile Tyr Phe
225                 230                 235                 240

Lys Pro Glu Tyr Lys Ile Ala Asp Pro Ile Cys Thr Phe Ile Phe Ser
                245                 250                 255

Ile Leu Val Leu Ala Ser Thr Ile Thr Ile Leu Lys Asp Phe Ser Ile
            260                 265                 270

Leu Leu Met Glu Gly Val Pro Lys Ser Leu Asn Tyr Ser Gly Val Lys
        275                 280                 285

Glu Leu Ile Leu Ala Val Asp Gly Val Leu Ser Val His Ser Leu His
    290                 295                 300

Ile Trp Ser Leu Thr Met Asn Gln Val Ile Leu Ser Ala His Val Ala
305                 310                 315                 320

Thr Ala Ala Ser Arg Asp Ser Gln Val Val Arg Arg Glu Ile Ala Lys
                325                 330                 335

Ala Leu Ser Lys Ser Phe Thr Met His Ser Leu Thr Ile Gln Met Glu
            340                 345                 350

Ser Pro Val Asp Gln Asp Pro Asp Cys Leu Phe Cys Glu Asp Pro Cys
        355                 360                 365

Asp
```

<210> 2422
<211> 18
<212> PRT
<213> Homo sapiens

<400> 2422

```
Leu Pro Arg Leu Ile Ala Phe Thr Ser Glu His Ser His Phe Ser Leu
1               5                   10                  15

Lys Lys
```

<210> 2423
<211> 14
<212> PRT
<213> Homo sapiens

<400> 2423

Val Asn Phe Phe Arg Met Val Ile Ser Asn Pro Ala Ala Thr
1 5 10

<210> 2424
<211> 10
<212> PRT
<213> Homo sapiens

<400> 2424

Pro Leu Ala Leu Glu Gly Ser Leu Gln Lys
1 5 10

<210> 2425
<211> 10
<212> PRT
<213> Homo sapiens

<400> 2425

Pro Leu Leu Ala Leu Leu Ala Leu Trp Gly
1 5 10

<210> 2426
<211> 12
<212> PRT
<213> Mus musculus

<400> 2426

Ala Ser Ser Leu Gly Gly Asn Gln Asp Thr Gln Tyr
1 5 10

<210> 2427
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2427

Ala Leu Gly Asp Leu Phe Gln Ser Ile
1 5

<210> 2428
<211> 10
<212> PRT
<213> Homo sapiens

<400> 2428

Ala Val Ala Ala Asn Ile Val Leu Thr Val
1 5 10

<210> 2429

<211> 10
<212> PRT
<213> Homo sapiens

<400> 2429

Phe Leu Leu Ser Leu Phe Ser Leu Trp Leu
1 5 10

<210> 2430
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2430

His Ile Ala Gly Ser Leu Ala Val Val
1 5

<210> 2431
<211> 10
<212> PRT
<213> Homo sapiens

<400> 2431

Ile Leu Ala Val Asp Gly Val Leu Ser Val
1 5 10

<210> 2432
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2432

Ile Leu Lys Asp Phe Ser Ile Leu Leu
1 5

<210> 2433
<211> 10
<212> PRT
<213> Homo sapiens

<400> 2433

Ile Leu Val Leu Ala Ser Thr Ile Thr Ile
1 5 10

<210> 2434
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2434

Leu Leu Ile Asp Leu Thr Ser Phe Leu
1 5

<210> 2435
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2435

Ser Ile Ser Val Leu Ile Ser Ala Leu
1 5

<210> 2436
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2436

Val Val Thr Gly Val Leu Val Tyr Leu
1 5

<210> 2437
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2437

Phe Ile Phe Ser Ile Leu Val Leu Ala
1 5

<210> 2438
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2438

Ile Gln Ala Thr Val Met Ile Ile Val
1 5

<210> 2439
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2439

Lys Met Tyr Ala Phe Thr Leu Glu Ser
1 5

<210> 2440
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2440

Lys Ser Leu Asn Tyr Ser Gly Val Lys
1 5

<210> 2441
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2441

Leu Leu Ser Ile Leu Cys Ile Trp Val
1 5

<210> 2442
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2442

Leu Leu Ser Leu Phe Ser Leu Trp Leu
1 5

<210> 2443
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2443

Met Ile Ile Val Ser Ser Cys Ala Val
1 5

<210> 2444
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2444

Arg Leu Leu Tyr Pro Asp Tyr Gln Ile
1 5

<210> 2445
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2445

Thr Met His Ser Leu Thr Ile Gln Met
1 5

<210> 2446
<211> 9
<212> PRT

<213> Homo sapiens

<400> 2446

Val Ala Ala Asn Ile Val Leu Thr Val
1 5

<210> 2447
<211> 27
<212> PRT
<213> Homo sapiens

<400> 2447

Ala Cys Glu Arg Leu Leu Tyr Pro Asp Tyr Gln Ile Gln Ala Thr Val
1 5 10 15

Met Ile Ile Val Ser Ser Cys Ala Val Ala Ala
20 25

<210> 2448
<211> 27
<212> PRT
<213> Homo sapiens

<400> 2448

Ala Lys Met His Ala Phe Thr Leu Glu Ser Val Glu Leu Gln Gln Lys
1 5 10 15

Pro Val Asn Lys Asp Gln Cys Pro Arg Glu Arg
20 25

<210> 2449
<211> 27
<212> PRT
<213> Homo sapiens

<400> 2449

Ala Asn Glu Tyr Ala Tyr Ala Lys Trp Lys Leu Cys Ser Ala Ser Ala
1 5 10 15

Ile Cys Phe Ile Phe Met Ile Ala Glu Val Val
20 25

<210> 2450
<211> 34
<212> PRT
<213> Homo sapiens

<400> 2450

Ala Ser Arg Asp Ser Gln Val Val Arg Arg Glu Ile Ala Lys Ala Leu
1 5 10 15

Ser Lys Ser Phe Thr Met His Ser Leu Thr Ile Gln Met Glu Ser Pro
            20   25   30

Val Asp

<210> 2451
<211> 27
<212> PRT
<213> Homo sapiens

<400> 2451

Asp Gly Val Leu Ser Val His Ser Leu His Ile Trp Ser Leu Thr Met
1   5   10   15

Asn Gln Val Ile Leu Ser Ala His Val Ala Thr
            20   25

<210> 2452
<211> 27
<212> PRT
<213> Homo sapiens

<400> 2452

Glu Glu Leu Glu Ser Gly Gly Met Tyr His Cys His Ser Gly Ser Lys
1   5   10   15

Pro Thr Glu Lys Gly Ala Asn Glu Tyr Ala Tyr
            20   25

<210> 2453
<211> 41
<212> PRT
<213> Homo sapiens

<400> 2453

Phe Gly Trp His Arg Ala Glu Ile Leu Gly Ala Leu Leu Ser Ile Leu
1   5   10   15

Cys Ile Trp Val Val Thr Gly Val Leu Val Tyr Leu Ala Cys Glu Arg
            20   25   30

Leu Leu Tyr Pro Asp Tyr Gln Ile Gln
        35   40

<210> 2454
<211> 27
<212> PRT
<213> Homo sapiens

<400> 2454

Phe Ile Phe Ser Ile Leu Val Leu Ala Ser Thr Ile Thr Ile Leu Lys
1 5 10 15

Asp Phe Ser Ile Leu Leu Met Glu Gly Val Pro
20 25

<210> 2455
<211> 27
<212> PRT
<213> Homo sapiens

<400> 2455

Gly His Ile Ala Gly Ser Leu Ala Val Val Thr Asp Ala Ala His Leu
1 5 10 15

Leu Ile Asp Leu Thr Ser Phe Leu Leu Ser Leu
20 25

<210> 2456
<211> 27
<212> PRT
<213> Homo sapiens

<400> 2456

His Leu Leu Ile Asp Leu Thr Ser Phe Leu Leu Ser Leu Phe Ser Leu
1 5 10 15

Trp Leu Ser Ser Lys Pro Pro Ser Lys Arg Leu
20 25

<210> 2457
<211> 27
<212> PRT
<213> Homo sapiens

<400> 2457

His Gln Arg Cys Leu Gly His Asn His Lys Glu Val Gln Ala Asn Ala
1 5 10 15

Ser Val Arg Ala Ala Phe Val His Ala Leu Gly
20 25

<210> 2458
<211> 27
<212> PRT
<213> Homo sapiens

<400> 2458

Leu Phe Gln Ser Ile Ser Val Leu Ile Ser Ala Leu Ile Ile Tyr Phe

1 5 10 15

Lys Pro Glu Tyr Lys Ile Ala Asp Pro Ile Cys
20 25

<210> 2459
<211> 27
<212> PRT
<213> Homo sapiens

<400> 2459

Leu Lys Asp Phe Ser Ile Leu Leu Met Glu Gly Val Pro Lys Ser Leu
1 5 10 15

Asn Tyr Ser Gly Val Lys Glu Leu Ile Leu Ala
20 25

<210> 2460
<211> 27
<212> PRT
<213> Homo sapiens

<400> 2460

Met Glu Phe Leu Glu Arg Thr Tyr Leu Val Asn Asp Lys Ala Ala Lys
1 5 10 15

Met His Ala Phe Thr Leu Glu Ser Val Glu Leu
20 25

<210> 2461
<211> 26
<212> PRT
<213> Homo sapiens

<400> 2461

Met His Ser Leu Thr Ile Gln Met Glu Ser Pro Val Asp Gln Asp Pro
1 5 10 15

Asp Cys Leu Phe Cys Glu Asp Pro Cys Asp
20 25

<210> 2462
<211> 27
<212> PRT
<213> Homo sapiens

<400> 2462

Asn Ala Ser Val Arg Ala Ala Phe Val His Ala Leu Gly Asp Leu Phe
1 5 10 15

Gln Ser Ile Ser Val Leu Ile Ser Ala Leu Ile
            20   25

<210> 2463
<211> 27
<212> PRT
<213> Homo sapiens

<400> 2463

Gln Lys Pro Val Asn Lys Asp Gln Cys Pro Arg Glu Arg Pro Glu Glu
1   5   10   15

Leu Glu Ser Gly Gly Met Tyr His Cys His Ser
            20   25

<210> 2464
<211> 27
<212> PRT
<213> Homo sapiens

<400> 2464

Ser Ala Ile Cys Phe Ile Phe Met Ile Ala Glu Val Val Gly Gly His
1   5   10   15

Ile Ala Gly Ser Leu Ala Val Val Thr Asp Ala
            20   25

<210> 2465
<211> 27
<212> PRT
<213> Homo sapiens

<400> 2465

Ser Cys Ala Val Ala Ala Asn Ile Val Leu Thr Val Val Leu His Gln
1   5   10   15

Arg Cys Leu Gly His Asn His Lys Glu Val Gln
            20   25

<210> 2466
<211> 27
<212> PRT
<213> Homo sapiens

<400> 2466

Ser Leu Asn Tyr Ser Gly Val Lys Glu Leu Ile Leu Ala Val Asp Gly
1   5   10   15

Val Leu Ser Val His Ser Leu His Ile Trp Ser
            20   25

<210> 2467
<211> 27
<212> PRT
<213> Homo sapiens

<400> 2467

Ser Leu Trp Leu Ser Ser Lys Pro Pro Ser Lys Arg Leu Thr Phe Gly
1 5 10 15

Trp His Arg Ala Glu Ile Leu Gly Ala Leu Leu
20 25

<210> 2468
<211> 27
<212> PRT
<213> Homo sapiens

<400> 2468

Thr Met Asn Gln Val Ile Leu Ser Ala His Val Ala Thr Ala Ala Ser
1 5 10 15

Arg Asp Ser Gln Val Val Arg Arg Glu Ile Ala
20 25

<210> 2469
<211> 27
<212> PRT
<213> Homo sapiens

<400> 2469

Tyr Phe Lys Pro Glu Tyr Lys Ile Ala Asp Pro Ile Cys Thr Phe Ile
1 5 10 15

Phe Ser Ile Leu Val Leu Ala Ser Thr Ile Thr
20 25

<210> 2470
<211> 9
<212> PRT
<213> Mus musculus

<400> 2470

Ala Ile Asn Ser Glu Met Phe Leu Arg
1 5

<210> 2471
<211> 10
<212> PRT
<213> Mus musculus

<400> 2471

Leu Ala Leu Glu Val Ala Arg Gln Lys Arg
1 5 10

<210> 2472
<211> 10
<212> PRT
<213> Mus musculus

<400> 2472

Thr Leu Ala Leu Glu Val Ala Gln Gln Lys
1 5 10

<210> 2473
<211> 10
<212> PRT
<213> Mus musculus

<400> 2473

Thr Leu Ala Leu Glu Val Ala Arg Gln Lys
1 5 10

<210> 2474
<211> 20
<212> PRT
<213> Mycobacterium tuberculosis

<400> 2474

Thr Leu Val Val Asn Lys Ile Arg Gly Thr Phe Lys Ser Val Ala Val
1 5 10 15

Lys Ala Pro Gly
20

<210> 2475
<211> 20
<212> PRT
<213> Chlamydia pneumoniae

<400> 2475

Thr Leu Val Val Asn Lys Leu Gln Gly Leu Leu Gln Val Thr Val Val
1 5 10 15

Thr Ile Pro Gln
20

<210> 2476
<211> 14
<212> PRT
<213> Homo sapiens

<400> 2476

Leu Thr Val Gly Leu Thr Arg Arg Gly Gln Pro Arg Gln Tyr
1 5 10

<210> 2477
<211> 13
<212> PRT
<213> Homo sapiens

<400> 2477

Tyr Asn Gln Tyr Ser Gln Arg Tyr His Gln Arg Thr Asn
1 5 10

<210> 2478
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2478

Ala Cys Asp Gly Glu Arg Pro Thr Leu
1 5

<210> 2479
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2479

Ala His Val Asp Lys Cys Leu Glu Leu
1 5

<210> 2480
<211> 10
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2480

Ala Leu Trp Gly Pro Asp Pro Ala Ala Val
1 5 10

<210> 2481
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2481

Ala Pro Val Ile Lys Ala Arg Met Met
1 5

<210> 2482
<211> 10
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2482

Ala Gln Trp Gly Pro Asp Pro Ala Ala Val
1 5 10

<210> 2483
<211> 10
<212> PRT
<213> Homo sapiens

<400> 2483

His Pro Arg Tyr Phe Asn Gln Leu Ser Thr
1 5 10

<210> 2484
<211> 10
<212> PRT
<213> Homo sapiens

<400> 2484

Ile Pro Ser Asp Leu Glu Arg Arg Ile Leu
1 5 10

<210> 2485
<211> 10
<212> PRT
<213> Unknown

<220>
<223> epitope involved in diabetes

<400> 2485

Arg Gln Trp Gly Pro Asp Pro Ala Ala Val
1 5 10

<210> 2486
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2486

Ser Pro Gly Ser Gly Phe Trp Ser Phe
1 5

<210> 2487
<211> 1015

<212> PRT
<213> Homo sapiens

<400> 2487

```
Met Gly Pro Pro Leu Pro Leu Leu Leu Leu Leu Leu Leu Leu Leu Pro
1               5                  10                  15

Pro Arg Val Leu Pro Ala Ala Pro Ser Ser Val Pro Arg Gly Arg Gln
            20                  25                  30

Leu Pro Gly Arg Leu Gly Cys Leu Leu Glu Glu Gly Leu Cys Gly Ala
        35                  40                  45

Ser Glu Ala Cys Val Asn Asp Gly Val Phe Gly Arg Cys Gln Lys Val
    50                  55                  60

Pro Ala Met Asp Phe Tyr Arg Tyr Glu Val Ser Pro Val Ala Leu Gln
65                  70                  75                  80

Arg Leu Arg Val Ala Leu Gln Lys Leu Ser Gly Thr Gly Phe Thr Trp
                85                  90                  95

Gln Asp Asp Tyr Thr Gln Tyr Val Met Asp Gln Glu Leu Ala Asp Leu
            100                 105                 110

Pro Lys Thr Tyr Leu Arg Arg Pro Glu Ala Ser Ser Pro Ala Arg Pro
        115                 120                 125

Ser Lys His Ser Val Gly Ser Glu Arg Arg Tyr Ser Arg Glu Gly Gly
    130                 135                 140

Ala Ala Leu Ala Asn Ala Leu Arg Arg His Leu Pro Phe Leu Glu Ala
145                 150                 155                 160

Leu Ser Gln Ala Pro Ala Ser Asp Val Leu Ala Arg Thr His Thr Ala
                165                 170                 175

Gln Asp Arg Pro Pro Ala Glu Gly Asp Asp Arg Phe Ser Glu Ser Ile
            180                 185                 190

Leu Thr Tyr Val Ala His Thr Ser Ala Leu Thr Tyr Pro Pro Gly Ser
        195                 200                 205

Arg Thr Gln Leu Arg Glu Asp Leu Leu Pro Arg Thr Leu Gly Gln Leu
    210                 215                 220

Gln Pro Asp Glu Leu Ser Pro Lys Val Asp Ser Gly Val Asp Arg His
225                 230                 235                 240
```

```
His Leu Met Ala Ala Leu Ser Ala Tyr Ala Ala Gln Arg Pro Pro Ala
                245                 250                 255

Pro Pro Gly Glu Gly Ser Leu Glu Pro Gln Tyr Leu Leu Arg Ala Pro
            260                 265                 270

Ser Arg Met Pro Arg Pro Leu Leu Ala Pro Ala Ala Pro Gln Lys Trp
        275                 280                 285

Pro Ser Pro Leu Gly Asp Ser Glu Asp Pro Ser Ser Thr Gly Asp Gly
    290                 295                 300

Ala Arg Ile His Thr Leu Leu Lys Asp Leu Gln Arg Gln Pro Ala Glu
305                 310                 315                 320

Val Arg Gly Leu Ser Gly Leu Glu Leu Asp Gly Met Ala Glu Leu Met
                325                 330                 335

Ala Gly Leu Met Gln Gly Val Asp His Gly Val Ala Arg Gly Ser Pro
            340                 345                 350

Gly Arg Ala Ala Leu Gly Glu Ser Gly Glu Gln Ala Asp Gly Pro Lys
        355                 360                 365

Ala Thr Leu Arg Gly Asp Ser Phe Pro Asp Asp Gly Val Gln Asp Asp
    370                 375                 380

Asp Asp Arg Leu Tyr Gln Glu Val His Arg Leu Ser Ala Thr Leu Gly
385                 390                 395                 400

Gly Leu Leu Gln Asp His Gly Ser Arg Leu Leu Pro Gly Ala Leu Pro
                405                 410                 415

Phe Ala Arg Pro Leu Asp Met Glu Arg Lys Lys Ser Glu His Pro Glu
            420                 425                 430

Ser Ser Leu Ser Ser Glu Glu Glu Thr Ala Gly Val Glu Asn Val Lys
        435                 440                 445

Ser Gln Thr Tyr Ser Lys Asp Leu Leu Gly Gln Gln Pro His Ser Glu
    450                 455                 460

Pro Gly Ala Ala Ala Phe Gly Glu Leu Gln Asn Gln Met Pro Gly Pro
465                 470                 475                 480

Ser Lys Glu Glu Gln Ser Leu Pro Ala Gly Ala Gln Glu Ala Leu Ser
```

485 490 495

Asp Gly Leu Gln Leu Glu Val Gln Pro Ser Glu Glu Glu Ala Arg Gly
500 505 510

Tyr Ile Val Thr Asp Arg Asp Pro Leu Arg Pro Glu Glu Gly Arg Arg
515 520 525

Leu Val Glu Asp Val Ala Arg Leu Leu Gln Val Pro Ser Ser Ala Phe
530 535 540

Ala Asp Val Glu Val Leu Gly Pro Ala Val Thr Phe Lys Val Ser Ala
545 550 555 560

Asn Val Gln Asn Val Thr Thr Glu Asp Val Glu Lys Ala Thr Val Asp
565 570 575

Asn Lys Asp Lys Leu Glu Glu Thr Ser Gly Leu Lys Ile Leu Gln Thr
580 585 590

Gly Val Gly Ser Lys Ser Lys Leu Lys Phe Leu Pro Pro Gln Ala Glu
595 600 605

Gln Glu Asp Ser Thr Lys Phe Ile Ala Leu Thr Leu Val Ser Leu Ala
610 615 620

Cys Ile Leu Gly Val Leu Leu Ala Ser Gly Leu Ile Tyr Cys Leu Arg
625 630 635 640

His Ser Ser Gln His Arg Leu Lys Glu Lys Leu Ser Gly Leu Gly Gly
645 650 655

Asp Pro Gly Ala Asp Ala Thr Ala Ala Tyr Gln Glu Leu Cys Arg Gln
660 665 670

Arg Met Ala Thr Arg Pro Pro Asp Arg Pro Glu Gly Pro His Thr Ser
675 680 685

Arg Ile Ser Ser Val Ser Ser Gln Phe Ser Asp Gly Pro Ile Pro Ser
690 695 700

Pro Ser Ala Arg Ser Ser Ala Ser Ser Trp Ser Glu Glu Pro Val Gln
705 710 715 720

Ser Asn Met Asp Ile Ser Thr Gly His Met Ile Leu Ser Tyr Met Glu
725 730 735

```
Asp His Leu Lys Asn Lys Asn Arg Leu Glu Lys Glu Trp Glu Ala Leu
            740                 745                 750

Cys Ala Tyr Gln Ala Glu Pro Asn Ser Ser Phe Val Ala Gln Arg Glu
        755                 760                 765

Glu Asn Val Pro Lys Asn Arg Ser Leu Ala Val Leu Thr Tyr Asp His
    770                 775                 780

Ser Arg Val Leu Leu Lys Ala Glu Asn Ser His Ser His Ser Asp Tyr
785                 790                 795                 800

Ile Asn Ala Ser Pro Ile Met Asp His Asp Pro Arg Asn Pro Ala Tyr
                805                 810                 815

Ile Ala Thr Gln Gly Pro Leu Pro Ala Thr Val Ala Asp Phe Trp Gln
            820                 825                 830

Met Val Trp Glu Ser Gly Cys Val Val Ile Val Met Leu Thr Pro Leu
        835                 840                 845

Ala Glu Asn Gly Val Arg Gln Cys Tyr His Tyr Trp Pro Asp Glu Gly
    850                 855                 860

Ser Asn Leu Tyr His Ile Tyr Glu Val Asn Leu Val Ser Glu His Ile
865                 870                 875                 880

Trp Cys Glu Asp Phe Leu Val Arg Ser Phe Tyr Leu Lys Asn Leu Gln
                885                 890                 895

Thr Asn Glu Thr Arg Thr Val Thr Gln Phe His Phe Leu Ser Trp Tyr
            900                 905                 910

Asp Arg Gly Val Pro Ser Ser Ser Arg Ser Leu Leu Asp Phe Arg Arg
        915                 920                 925

Lys Val Asn Lys Cys Tyr Arg Gly Arg Ser Cys Pro Ile Ile Val His
    930                 935                 940

Cys Ser Asp Gly Ala Gly Arg Ser Gly Thr Tyr Val Leu Ile Asp Met
945                 950                 955                 960

Val Leu Asn Lys Met Ala Lys Gly Ala Lys Glu Ile Asp Ile Ala Ala
                965                 970                 975

Thr Leu Glu His Leu Arg Asp Gln Arg Pro Gly Met Val Gln Thr Lys
            980                 985                 990
```

```
Glu Gln Phe Glu Phe Ala Leu Thr  Ala Val Ala Glu Glu  Val Asn Ala
        995                 1000                1005


Ile Leu  Lys Ala Leu Pro Gln
    1010                1015


<210>  2488
<211>  979
<212>  PRT
<213>  Homo sapiens

<400>  2488

Met Arg Arg Pro Arg Arg Pro Gly Gly Leu Gly Gly Ser Gly Gly Leu
1               5                   10                  15


Arg Leu Leu Leu Cys Leu Leu Leu Leu Ser Ser Arg Pro Gly Gly Cys
            20                  25                  30


Ser Ala Val Ser Ala His Gly Cys Leu Phe Asp Arg Arg Leu Cys Ser
        35                  40                  45


His Leu Glu Val Cys Ile Gln Asp Gly Leu Phe Gly Gln Cys Gln Val
    50                  55                  60


Gly Val Gly Gln Ala Arg Pro Leu Leu Gln Val Thr Ser Pro Val Leu
65                  70                  75                  80


Gln Arg Leu Gln Gly Val Leu Arg Gln Leu Met Ser Gln Gly Leu Ser
                85                  90                  95


Trp His Asp Asp Leu Thr Gln Tyr Val Ile Ser Gln Glu Met Glu Arg
            100                 105                 110


Ile Pro Arg Leu Arg Pro Pro Glu Pro Arg Pro Arg Asp Arg Ser Gly
        115                 120                 125


Leu Ala Pro Lys Arg Pro Gly Pro Ala Gly Glu Leu Leu Leu Gln Asp
    130                 135                 140


Ile Pro Thr Gly Ser Ala Pro Ala Ala Gln His Arg Leu Pro Gln Pro
145                 150                 155                 160


Pro Val Gly Lys Gly Gly Ala Gly Ala Ser Ser Ser Leu Ser Pro Leu
                165                 170                 175


Gln Ala Glu Leu Leu Pro Pro Leu Leu Glu His Leu Leu Leu Pro Pro
            180                 185                 190
```

```
Gln Pro Pro His Pro Ser Leu Ser Tyr Glu Pro Ala Leu Leu Gln Pro
        195                 200                 205

Tyr Leu Phe His Gln Phe Gly Ser Arg Asp Gly Ser Arg Val Ser Glu
    210                 215                 220

Gly Ser Pro Gly Met Val Ser Val Gly Pro Leu Pro Lys Ala Glu Ala
225                 230                 235                 240

Pro Ala Leu Phe Ser Arg Thr Ala Ser Lys Gly Ile Phe Gly Asp His
                245                 250                 255

Pro Gly His Ser Tyr Gly Asp Leu Pro Gly Pro Ser Pro Ala Gln Leu
            260                 265                 270

Phe Gln Asp Ser Gly Leu Leu Tyr Leu Ala Gln Glu Leu Pro Ala Pro
        275                 280                 285

Ser Arg Ala Arg Val Pro Arg Leu Pro Glu Gln Gly Ser Ser Ser Arg
    290                 295                 300

Ala Glu Asp Ser Pro Glu Gly Tyr Glu Lys Glu Gly Leu Gly Asp Arg
305                 310                 315                 320

Gly Glu Lys Pro Ala Ser Pro Ala Val Gln Pro Asp Ala Ala Leu Gln
                325                 330                 335

Arg Leu Ala Ala Val Leu Ala Gly Tyr Gly Val Glu Leu Arg Gln Leu
            340                 345                 350

Thr Pro Glu Gln Leu Ser Thr Leu Leu Thr Leu Leu Gln Leu Leu Pro
        355                 360                 365

Lys Gly Ala Gly Arg Asn Pro Gly Gly Val Val Asn Val Gly Ala Asp
    370                 375                 380

Ile Lys Lys Thr Met Glu Gly Pro Val Glu Gly Arg Asp Thr Ala Glu
385                 390                 395                 400

Leu Pro Ala Arg Thr Ser Pro Met Pro Gly His Pro Thr Ala Ser Pro
                405                 410                 415

Thr Ser Ser Glu Val Gln Gln Val Pro Ser Pro Val Ser Ser Glu Pro
            420                 425                 430

Pro Lys Ala Ala Arg Pro Pro Val Thr Pro Val Leu Leu Glu Lys Lys
        435                 440                 445
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Ser Pro Leu Gly Gln Ser Gln Pro Thr Val Ala Gly Gln Pro Ser Ala
    450                 455                 460

Arg Pro Ala Ala Glu Glu Tyr Gly Tyr Ile Val Thr Asp Gln Lys Pro
465                 470                 475                 480

Leu Ser Leu Ala Ala Gly Val Lys Leu Leu Glu Ile Leu Ala Glu His
                485                 490                 495

Val His Met Ser Ser Gly Ser Phe Ile Asn Ile Ser Val Val Gly Pro
            500                 505                 510

Ala Leu Thr Phe Arg Ile Arg His Asn Glu Gln Asn Leu Ser Leu Ala
        515                 520                 525

Asp Val Thr Gln Gln Ala Gly Leu Val Lys Ser Glu Leu Glu Ala Gln
    530                 535                 540

Thr Gly Leu Gln Ile Leu Gln Thr Gly Val Gly Gln Arg Glu Glu Ala
545                 550                 555                 560

Ala Ala Val Leu Pro Gln Thr Ala His Ser Thr Ser Pro Met Arg Ser
                565                 570                 575

Val Leu Leu Thr Leu Val Ala Leu Ala Gly Val Ala Gly Leu Leu Val
            580                 585                 590

Ala Leu Ala Val Ala Leu Cys Val Arg Gln His Ala Arg Gln Gln Asp
        595                 600                 605

Lys Glu Arg Leu Ala Ala Leu Gly Pro Glu Gly Ala His Gly Asp Thr
    610                 615                 620

Thr Phe Glu Tyr Gln Asp Leu Cys Arg Gln His Met Ala Thr Lys Ser
625                 630                 635                 640

Leu Phe Asn Arg Ala Glu Gly Pro Pro Glu Pro Ser Arg Val Ser Ser
                645                 650                 655

Val Ser Ser Gln Phe Ser Asp Ala Ala Gln Ala Ser Pro Ser Ser His
            660                 665                 670

Ser Ser Thr Pro Ser Trp Cys Glu Glu Pro Ala Gln Ala Asn Met Asp
        675                 680                 685

Ile Ser Thr Gly His Met Ile Leu Ala Tyr Met Glu Asp His Leu Arg
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690 695 700

Asn Arg Asp Arg Leu Ala Lys Glu Trp Gln Ala Leu Cys Ala Tyr Gln
705 710 715 720

Ala Glu Pro Asn Thr Cys Ala Thr Ala Gln Gly Glu Gly Asn Ile Lys
725 730 735

Lys Asn Arg His Pro Asp Phe Leu Pro Tyr Asp His Ala Arg Ile Lys
740 745 750

Leu Lys Val Glu Ser Ser Pro Ser Arg Ser Asp Tyr Ile Asn Ala Ser
755 760 765

Pro Ile Ile Glu His Asp Pro Arg Met Pro Ala Tyr Ile Ala Thr Gln
770 775 780

Gly Pro Leu Ser His Thr Ile Ala Asp Phe Trp Gln Met Val Trp Glu
785 790 795 800

Ser Gly Cys Thr Val Ile Val Met Leu Thr Pro Leu Val Glu Asp Gly
805 810 815

Val Lys Gln Cys Asp Arg Tyr Trp Pro Asp Glu Gly Ala Ser Leu Tyr
820 825 830

His Val Tyr Glu Val Asn Leu Val Ser Glu His Ile Trp Cys Glu Asp
835 840 845

Phe Leu Val Arg Ser Phe Tyr Leu Lys Asn Val Gln Thr Gln Glu Thr
850 855 860

Arg Thr Leu Thr Gln Phe His Phe Leu Ser Trp Pro Ala Glu Gly Thr
865 870 875 880

Pro Ala Ser Thr Arg Pro Leu Leu Asp Phe Arg Arg Lys Val Asn Lys
885 890 895

Cys Tyr Arg Gly Arg Ser Cys Pro Ile Ile Val His Cys Ser Asp Gly
900 905 910

Ala Gly Arg Thr Gly Thr Tyr Ile Leu Ile Asp Met Val Leu Asn Arg
915 920 925

Met Ala Lys Gly Val Lys Glu Ile Asp Ile Ala Ala Thr Leu Glu His
930 935 940

Val Arg Asp Gln Arg Pro Gly Leu Val Arg Ser Lys Asp Gln Phe Glu
945 950 955 960

Phe Ala Leu Thr Ala Val Ala Glu Glu Val Asn Ala Ile Leu Lys Ala
965 970 975

Leu Pro Gln

<210> 2489
<211> 11
<212> PRT
<213> Homo sapiens

<400> 2489

Glu Arg Leu Gly Pro Leu Val Glu Gln Gly Arg
1 5 10

<210> 2490
<211> 20
<212> PRT
<213> Mus musculus

<400> 2490

Lys Cys Asn Thr Ala Thr Cys Ala Thr Gln Arg Ala Leu Asn Phe Leu
1 5 10 15

Val Arg Ser Ser
20

<210> 2491
<211> 18
<212> PRT
<213> Mus musculus

<400> 2491

Phe Ala Ile Asn Ser Glu Met Phe Leu Arg Ser Cys Gln Gly Glu Asn
1 5 10 15

Gly Thr

<210> 2492
<211> 18
<212> PRT
<213> Mus musculus

<400> 2492

Phe Ile Lys Ile Pro Thr His Ala Glu Pro Leu Phe Tyr Leu Leu Ser
1 5 10 15

Phe Cys

<210> 2493
<211> 18
<212> PRT
<213> Mus musculus

<400> 2493

Leu Thr Thr Met Gln Leu Tyr Arg Phe Ile Lys Ile Pro Thr His Ala
1 5 10 15

Glu Pro

<210> 2494
<211> 18
<212> PRT
<213> Mus musculus

<400> 2494

Thr Lys Met Ile Trp Val Ala Val Ile Gly Asp Trp Phe Asn Leu Ile
1 5 10 15

Phe Lys

<210> 2495
<211> 7
<212> PRT
<213> Mycobacterium avium

<400> 2495

Gly Asp Ser Ala Arg Val Leu
1 5

<210> 2496
<211> 7
<212> PRT
<213> Mycobacterium avium

<400> 2496

His Ala Thr Val Gln Ile Asp
1 5

<210> 2497
<211> 7
<212> PRT
<213> Mycobacterium avium

<400> 2497

His Leu Ile Ser Thr Gly Asp
1 5

<210> 2498
<211> 9
<212> PRT
<213> Mycobacterium avium

<400> 2498

Leu Ala Ala Asn Phe Val Val Ala Leu
1 5

<210> 2499
<211> 7
<212> PRT
<213> Mycobacterium avium

<400> 2499

Leu Ser Pro Gly Lys Asp Met
1 5

<210> 2500
<211> 9
<212> PRT
<213> Mycobacterium avium

<400> 2500

Met Ile Ala Val Ala Leu Ala Gly Leu
1 5

<210> 2501
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2501

Glu Arg Thr Tyr Leu Val Asn Asp Lys Ala Ala Lys Met His Ala
1 5 10 15

<210> 2502
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2502

Ile Phe Ser Ile Leu Val Leu Ala Ser Thr Ile Thr Ile Leu Lys
1 5 10 15

<210> 2503
<211> 23
<212> PRT

<213> Homo sapiens

<400> 2503

Lys Glu Arg Leu Ala Ala Leu Gly Pro Glu Gly Ala His Gly Asp Thr
1 5 10 15

Thr Phe Glu Tyr Gln Asp Leu
20

<210> 2504
<211> 14
<212> PRT
<213> Homo sapiens

<400> 2504

Tyr Ala Tyr Ala Lys Trp Lys Leu Cys Ser Ala Ser Ala Ile
1 5 10

<210> 2505
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2505

Tyr Lys Ile Ala Asp Pro Ile Cys Thr Phe Ile Phe Ser Ile Leu
1 5 10 15

<210> 2506
<211> 20
<212> PRT
<213> Mycobacterium tuberculosis

<400> 2506

Ala Ala Ser Gly Pro Lys Val Val Ile Asp Gly Lys Asp Gln Asn Val
1 5 10 15

Thr Gly Ser Val
20

<210> 2507
<211> 20
<212> PRT
<213> Human herpesvirus

<400> 2507

Ala Gly Ala Gly Gly Gly Ala Gly Gly Ala Gly Ala Gly Gly Gly Ala
1 5 10 15

Gly Gly Ala Gly
20

<210> 2508
<211> 21
<212> PRT
<213> Human herpesvirus

<400> 2508

Ala Gly Ala Gly Gly Gly Ala Gly Gly Ala Gly Ala Gly Gly Gly Ala
1 5 10 15

Gly Gly Ala Gly Ala
20

<210> 2509
<211> 15
<212> PRT
<213> Mycobacterium tuberculosis

<400> 2509

Ala Gly Lys Pro Leu Leu Ile Ile Ala Glu Asp Val Glu Gly Glu
1 5 10 15

<210> 2510
<211> 13
<212> PRT
<213> Homo sapiens

<400> 2510

Ala Gly Trp Leu Ala Asp Arg Ser Val Arg Tyr Pro Ile
1 5 10

<210> 2511
<211> 10
<212> PRT
<213> Mycobacterium tuberculosis

<400> 2511

Ala Leu Ser Thr Leu Val Val Asn Lys Ile
1 5 10

<210> 2512
<211> 15
<212> PRT
<213> Mycobacterium tuberculosis

<400> 2512

Ala Leu Ser Thr Leu Val Val Asn Lys Ile Arg Gly Thr Phe Lys
1 5 10 15

<210> 2513
<211> 20
<212> PRT

<213> Mycobacterium tuberculosis

<400> 2513

Ala Ser Ala Thr Lys Asp Gly Ser His Tyr Lys Ile Thr Gly Thr Ala
1 5 10 15

Thr Gly Val Asp
20

<210> 2514
<211> 20
<212> PRT
<213> Mycobacterium tuberculosis

<400> 2514

Ala Thr Gly Val Asp Met Ala Asn Pro Met Ser Pro Val Asn Lys Ser
1 5 10 15

Phe Glu Ile Glu
20

<210> 2515
<211> 10
<212> PRT
<213> Human herpesvirus

<400> 2515

Ala Val Phe Asp Arg Lys Ser Asp Ala Lys
1 5 10

<210> 2516
<211> 9
<212> PRT
<213> Human herpesvirus

<400> 2516

Ala Tyr Arg Arg Arg Trp Arg Arg Leu
1 5

<210> 2517
<211> 9
<212> PRT
<213> Human herpesvirus

<400> 2517

Cys Leu Gly Gly Leu Leu Thr Met Val
1 5

<210> 2518
<211> 19
<212> PRT

<213> Mycobacterium leprae

<400> 2518

Asp Ala Trp Arg Glu Gly Glu Glu Phe Val Val Glu Phe Asp Leu Pro
1 5 10 15

Gly Ile Lys

<210> 2519
<211> 20
<212> PRT
<213> Mycobacterium tuberculosis

<400> 2519

Asp Gly Asn Pro Pro Glu Val Lys Ser Val Gly Leu Gly Asn Val Asn
1 5 10 15

Gly Val Thr Leu
20

<210> 2520
<211> 16
<212> PRT
<213> Mycobacterium tuberculosis

<400> 2520

Asp Leu Ser Leu Leu Gly Lys Ala Arg Lys Val Val Val Thr Lys Asp
1 5 10 15

<210> 2521
<211> 12
<212> PRT
<213> Human herpesvirus

<400> 2521

Asp Ser Glu Leu Glu Ile Lys Arg Tyr Lys Asn Arg
1 5 10

<210> 2522
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2522

Asp Thr Gln Phe Val Arg Phe Asp Ser Asp Ala Ala Ser Gln Arg
1 5 10 15

<210> 2523
<211> 15
<212> PRT

<213> Mycobacterium bovis

<400> 2523

Asp Val Glu Gly Glu Ala Leu Ser Thr Leu Val Val Asn Lys Ile
1 5 10 15

<210> 2524
<211> 15
<212> PRT
<213> Mycobacterium tuberculosis

<400> 2524

Glu Glu Ser Asn Thr Phe Gly Leu Gln Leu Glu Leu Thr Glu Gly
1 5 10 15

<210> 2525
<211> 9
<212> PRT
<213> Human herpesvirus

<400> 2525

Glu Leu Lys Arg Lys Met Ile Tyr Met
1 5

<210> 2526
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2526

Glu Asn Pro Val Val His Phe Phe Lys Asn Ile Val Thr Pro Arg
1 5 10 15

<210> 2527
<211> 11
<212> PRT
<213> Human herpesvirus

<400> 2527

Glu Pro Leu Pro Gln Gly Gln Leu Thr Ala Tyr
1 5 10

<210> 2528
<211> 6
<212> PRT
<213> Proteus mirabilis

<400> 2528

Glu Ser Arg Arg Ala Leu
1 5

<210> 2529
<211> 16
<212> PRT
<213> Homo sapiens

<400> 2529

Phe Asp Gln Lys Ile Val Glu Trp Asp Ser Arg Lys Ser Lys Tyr Phe
1 5 10 15

<210> 2530
<211> 9
<212> PRT
<213> Human herpesvirus

<400> 2530

Phe Leu Arg Gly Arg Ala Tyr Gly Leu
1 5

<210> 2531
<211> 18
<212> PRT
<213> Homo sapiens

<400> 2531

Phe Pro Lys Pro Pro Ser Tyr Asn Val Ala Thr Thr Leu Pro Ser Tyr
1 5 10 15

Asp Glu

<210> 2532
<211> 20
<212> PRT
<213> Human herpesvirus

<400> 2532

Gly Ala Gly Gly Gly Ala Gly Gly Ala Gly Ala Gly Gly Gly Ala Gly
1 5 10 15

Gly Ala Gly Ala
20

<210> 2533
<211> 24
<212> PRT
<213> Human herpesvirus

<400> 2533

Gly Gly Asp Asn His Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly
1 5 10 15

Gly Gly Arg Pro Gly Ala Pro Gly
            20

<210> 2534
<211> 24
<212> PRT
<213> Human herpesvirus

<400> 2534

Gly Gly Asp Asn His Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly
1   5   10   15

Gly Gly Arg Pro Gly Ala Pro Gly
            20

<210> 2535
<211> 24
<212> PRT
<213> Human herpesvirus

<400> 2535

Gly Gly Asp Asn His Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly
1   5   10   15

Gly Gly Arg Pro Gly Ala Pro Gly
            20

<210> 2536
<211> 24
<212> PRT
<213> Human herpesvirus

<400> 2536

Gly Gly Asp Asn His Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly
1   5   10   15

Gly Gly Arg Pro Gly Ala Pro Gly
            20

<210> 2537
<211> 15
<212> PRT
<213> Phaseolus vulgaris

<400> 2537

Gly Gly Tyr Gly Asp Gly Gly Ala His Gly Gly Gly Tyr Gly Gly
1   5   10   15

<210> 2538
<211> 9
<212> PRT

<213> Human herpesvirus

<400> 2538

Gly Leu Cys Thr Leu Val Ala Met Leu
1 5

<210> 2539
<211> 10
<212> PRT
<213> Mycobacterium tuberculosis

<400> 2539

Gly Leu Glu Pro Gly Val Val Ala Glu Lys
1 5 10

<210> 2540
<211> 11
<212> PRT
<213> Mycobacterium tuberculosis

<400> 2540

Gly Leu Glu Pro Gly Val Val Ala Glu Lys Val
1 5 10

<210> 2541
<211> 16
<212> PRT
<213> Mycobacterium leprae

<400> 2541

Gly Met Glu Pro Gly Val Val Ala Glu Lys Val Arg Asn Leu Ser Val
1 5 10 15

<210> 2542
<211> 15
<212> PRT
<213> Mycobacterium tuberculosis

<400> 2542

Ile Ala Phe Asn Ser Gly Leu Glu Pro Gly Val Val Ala Glu Lys
1 5 10 15

<210> 2543
<211> 16
<212> PRT
<213> Mycobacterium leprae

<400> 2543

Ile Ala Phe Asn Ser Gly Met Glu Pro Gly Val Val Ala Glu Lys Val
1 5 10 15

<210> 2544
<211> 20
<212> PRT
<213> Mycobacterium tuberculosis

<400> 2544

Ile Ala Ile Gly Gly Ala Ala Thr Gly Ile Ala Ala Val Leu Thr Asp
1 5 10 15

Gly Asn Pro Pro
20

<210> 2545
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2545

Lys Asp Leu Leu Glu Gln Lys Arg Ala Ala Val Asp Thr Tyr Cys
1 5 10 15

<210> 2546
<211> 14
<212> PRT
<213> Human herpesvirus

<400> 2546

Lys Gly Gly Trp Phe Gly Lys His Arg Gly Gln Gly Gly Ser
1 5 10

<210> 2547
<211> 22
<212> PRT
<213> Artemia franciscana

<400> 2547

Lys Lys Glu Glu Lys Lys Glu Glu Ser Glu Glu Glu Asp Glu Asp Met
1 5 10 15

Gly Phe Gly Leu Phe Asp
20

<210> 2548
<211> 9
<212> PRT
<213> Human herpesvirus

<400> 2548

Lys Arg Lys Met Ile Tyr Met Cys Tyr
1 5

<210> 2549
<211> 9
<212> PRT
<213> Human herpesvirus

<400> 2549

Lys Arg Pro Pro Ile Phe Ile Arg Arg
1 5

<210> 2550
<211> 9
<212> PRT
<213> Human herpesvirus

<400> 2550

Leu Leu Trp Thr Leu Val Val Leu Leu
1 5

<210> 2551
<211> 15
<212> PRT
<213> Mycobacterium tuberculosis

<400> 2551

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

<210> 2552
<211> 15
<212> PRT
<213> Mycobacterium tuberculosis

<400> 2552

Met Ser Pro Val Asn Lys Ser Phe Glu Ile Glu Val Thr Cys Ser
1 5 10 15

<210> 2553
<211> 9
<212> PRT
<213> Human herpesvirus

<400> 2553

Asn Leu Val Pro Met Val Ala Thr Val
1 5

<210> 2554
<211> 13
<212> PRT
<213> Influenza A virus

<400> 2554

Pro Lys Tyr Val Lys Gln Asn Thr Leu Lys Leu Ala Thr

1 5 10

<210> 2555
<211> 13
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2555

Pro Lys Tyr Val Lys Arg Asn Thr Leu Lys Leu Ala Thr
1 5 10

<210> 2556
<211> 12
<212> PRT
<213> Clostridium tetani

<400> 2556

Pro Leu Tyr Lys Lys Met Glu Ala Val Lys Leu Arg
1 5 10

<210> 2557
<211> 15
<212> PRT
<213> Mycobacterium sp.

<400> 2557

Pro Tyr Ile Leu Leu Val Ser Ser Lys Val Ser Thr Val Lys Asp
1 5 10 15

<210> 2558
<211> 16
<212> PRT
<213> Homo sapiens

<400> 2558

Gln Pro His Asp Leu Gly Lys Val Gly Glu Val Ile Val Thr Lys Asp
1 5 10 15

<210> 2559
<211> 8
<212> PRT
<213> Human herpesvirus

<400> 2559

Arg Ala Lys Phe Lys Gln Leu Leu
1 5

<210> 2560
<211> 14

<212> PRT
<213> Human herpesvirus

<400> 2560

Arg Ala Arg Gly Arg Gly Arg Gly Arg Gly Glu Lys Arg Pro
1 5 10

<210> 2561
<211> 15
<212> PRT
<213> Human herpesvirus

<400> 2561

Arg Arg Gly Arg Gly Arg Glu Arg Ala Arg Gly Gly Ser Arg Glu
1 5 10 15

<210> 2562
<211> 9
<212> PRT
<213> Human herpesvirus

<400> 2562

Arg Arg Ile Glu Glu Ile Cys Met Lys
1 5

<210> 2563
<211> 9
<212> PRT
<213> Human herpesvirus

<400> 2563

Arg Arg Leu Val Val Thr Leu Gln Cys
1 5

<210> 2564
<211> 9
<212> PRT
<213> Human herpesvirus

<400> 2564

Ser Glu Asn Asp Arg Leu Arg Leu Leu
1 5

<210> 2565
<211> 20
<212> PRT
<213> Mycobacterium tuberculosis

<400> 2565

Ser Gly Glu Thr Thr Thr Ala Ala Gly Thr Thr Ala Ser Pro Gly Ala
1 5 10 15

Ala Ser Gly Pro
20

<210> 2566
<211> 13
<212> PRT
<213> Influenza A virus

<400> 2566

Ser Gly Pro Leu Lys Ala Glu Ile Ala Gln Arg Leu Glu
1 5 10

<210> 2567
<211> 7
<212> PRT
<213> Mus musculus

<400> 2567

Ser Leu Ala Tyr Gly Leu Arg
1 5

<210> 2568
<211> 16
<212> PRT
<213> Mycobacterium tuberculosis

<400> 2568

Ser Val Ala Val Lys Ala Pro Gly Phe Gly Asp Arg Arg Lys Ala Met
1 5 10 15

<210> 2569
<211> 9
<212> PRT
<213> Human herpesvirus

<400> 2569

Ser Val Arg Asp Arg Leu Ala Arg Leu
1 5

<210> 2570
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2570

Thr Phe Gly Ala Gln Leu Glu Leu Thr
1 5

<210> 2571
<211> 9
<212> PRT
<213> Mycobacterium tuberculosis

<400> 2571

Thr Phe Gly Leu Gln Leu Glu Leu Thr
1 5

<210> 2572
<211> 15
<212> PRT
<213> Human T-cell lymphotrophic virus

<400> 2572

Thr Asn Ser His Val Pro Ile Leu Gln Glu Arg Pro Pro Leu Glu
1 5 10 15

<210> 2573
<211> 20
<212> PRT
<213> Mycobacterium tuberculosis

<400> 2573

Val Ala Gly Leu Ser Gly Cys Ser Ser Asn Lys Ser Thr Thr Gly Ser
1 5 10 15

Gly Glu Thr Thr
20

<210> 2574
<211> 17
<212> PRT
<213> Homo sapiens

<400> 2574

Val Asp Asp Thr Gln Phe Val Arg Phe Asp Ser Asp Ala Ala Ser Gln
1 5 10 15

Arg

<210> 2575
<211> 19
<212> PRT
<213> Homo sapiens

<400> 2575

Val Asp Asp Thr Gln Phe Val Arg Phe Asp Ser Asp Ala Ala Ser Gln
1 5 10 15

Arg Met Glu

<210> 2576
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2576

Val Asp Asp Thr Gln Phe Val Arg Phe Asp Ser Asp Ala Ala Ser Gln
1 5 10 15

Arg Met Glu Pro
20

<210> 2577
<211> 21
<212> PRT
<213> Homo sapiens

<400> 2577

Val Asp Asp Thr Gln Phe Val Arg Phe Asp Ser Asp Ala Ala Ser Gln
1 5 10 15

Arg Met Glu Pro Arg
20

<210> 2578
<211> 20
<212> PRT
<213> Mycobacterium tuberculosis

<400> 2578

Val Thr Gly Ser Val Val Cys Thr Thr Ala Ala Gly Asn Val Asn Ile
1 5 10 15

Ala Ile Gly Gly
20

<210> 2579
<211> 15
<212> PRT
<213> Mycobacterium bovis

<400> 2579

Val Val Ala Glu Lys Val Arg Asn Leu Pro Ala Gly His Gly Leu
1 5 10 15

<210> 2580
<211> 9
<212> PRT

<213> Human herpesvirus

<400> 2580

Tyr Val Leu Asp His Leu Ile Val Val
1 5

<210> 2581
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2581

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

Leu Ala Asp Ala
20

<210> 2582
<211> 22
<212> PRT
<213> Human herpesvirus

<400> 2582

Gly Gly Ala Gly Ala Gly Gly Gly Ala Gly Gly Ala Gly Ala Gly Gly
1 5 10 15

Gly Ala Gly Gly Ala Gly
20

<210> 2583
<211> 11
<212> PRT
<213> Homo sapiens

<400> 2583

Gly Leu Lys Gly Glu Gln Gly Glu Pro Gly Ala
1 5 10

<210> 2584
<211> 11
<212> PRT
<213> Gallus gallus

<400> 2584

Ile Ala Gly Phe Lys Gly Glu Gln Gly Pro Lys
1 5 10

<210> 2585
<211> 20
<212> PRT

<213> Mycobacterium tuberculosis

<400> 2585

Met Lys Arg Gly Leu Thr Val Ala Val Ala Gly Ala Ala Ile Leu Val
1 5 10 15

Ala Gly Leu Ser
20

<210> 2586
<211> 20
<212> PRT
<213> Mycobacterium tuberculosis

<400> 2586

Asn Gly Val Thr Leu Gly Tyr Thr Ser Gly Thr Cys Gln Gly Asn Ala
1 5 10 15

Ser Ala Thr Lys
20

<210> 2587
<211> 26
<212> PRT
<213> Gallus gallus

<400> 2587

Pro Thr Gly Pro Leu Gly Pro Lys Gly Gln Thr Gly Glu Leu Gly Ile
1 5 10 15

Ala Gly Phe Lys Gly Glu Gln Gly Pro Lys
20 25

<210> 2588
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2588

Ala Asp Gly Gly Ala Gln Gly Thr Ala
1 5

<210> 2589
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2589

Ala Asp Ile Trp Leu Thr Pro Asp Pro Thr Thr Pro
1 5 10

<210> 2590
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2590

Cys Val Asp Thr Arg Ser Gly Asn Cys Tyr Leu Asp Ile Arg Pro
1 5 10 15

<210> 2591
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2591

Asp Val Tyr Trp Leu Met Pro Asp Pro Pro Thr Ser
1 5 10

<210> 2592
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2592

Glu Pro Val Ser Gly Ser Phe Thr Thr Ala Leu Asp Gly Pro Ser
1 5 10 15

<210> 2593
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2593

Phe Phe Tyr Phe Phe Thr Gly Ser Ser Gln Leu Glu Phe Asp Pro
1 5 10 15

<210> 2594
<211> 15
<212> PRT
<213> Rattus norvegicus

<400> 2594

Gly Ile Ala Gly Phe Lys Gly Glu Gln Gly Pro Lys Gly Glu Thr
1 5 10 15

<210> 2595
<211> 21
<212> PRT
<213> Homo sapiens

<400> 2595

Gly Pro Lys Gly Gln Thr Gly Glu Pro Gly Ile Ala Gly Phe Lys Gly
1 5 10 15

Glu Gln Gly Pro Lys
20

<210> 2596
<211> 21
<212> PRT
<213> Homo sapiens

<400> 2596

Gly Pro Lys Gly Gln Thr Gly Lys Pro Gly Ile Ala Gly Phe Lys Gly
1 5 10 15

Glu Gln Gly Pro Lys
20

<210> 2597
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2597

Gly Thr Ser Thr Glu Val Trp Leu Ala Pro Asp Pro
1 5 10

<210> 2598
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2598

Gly Val Val Ser His Ser Phe Pro Ala Thr Leu Glu Thr Gln Glu
1 5 10 15

<210> 2599
<211> 12
<212> PRT
<213> Unknown

<220>

<223> epitope involved in rheumatoid arthritis

<400> 2599

His Leu Pro Ser Phe Leu Arg Pro Asp Pro Pro Leu
1 5 10

<210> 2600
<211> 12
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<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2600

Ile Phe Pro Ser Phe Leu Arg Pro Asp Pro Pro Leu
1 5 10

<210> 2601
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2601

Ile Ser Gly Leu Pro Ser Gly Gly Asp Asp Leu Glu Thr Ser Thr
1 5 10 15

<210> 2602
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2602

Ile Trp Tyr Ile Asn Cys Phe Gly Cys Glu Thr His Ala Met Leu
1 5 10 15

<210> 2603
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2603

Leu Ser Gly Leu Pro Ser Gly Gly Glu Val Leu Glu Ile Ser Val
1 5 10 15

<210> 2604
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2604

Leu Ser Ser Arg Glu Pro Gln Ala Arg
1 5

<210> 2605
<211> 11
<212> PRT
<213> Rattus norvegicus

<400> 2605

Leu Val Gly Pro Arg Gly Glu Arg Gly Phe Pro
1 5 10

<210> 2606
<211> 17
<212> PRT
<213> Homo sapiens

<400> 2606

Asn Glu Glu Gly Phe Phe Ser Ala Arg Gly His Arg Pro Leu Asp Lys
1 5 10 15

Lys

<210> 2607
<211> 12
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2607

Asn Ser Asp His Phe Leu Gln Pro Asp Pro Pro Leu
1 5 10

<210> 2608
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2608

Pro Gly Pro Ser Arg Ala His Phe Leu
1 5

<210> 2609
<211> 15
<212> PRT

<213> Escherichia coli

<400> 2609

Gln Lys Arg Ala Ala Tyr Asp Gln Tyr Gly His Ala Ala Phe Glu
1 5 10 15

<210> 2610
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2610

Arg Leu Thr Arg Glu Leu Tyr Ala Gln
1 5

<210> 2611
<211> 13
<212> PRT
<213> Homo sapiens

<400> 2611

Arg Ser Phe Thr Leu Ala Ser Ser Glu Thr Gly Val Gly
1 5 10

<210> 2612
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2612

Val Lys Glu Gly His Ser Pro Pro Asp Asp Val Asp Ile Val Ile
1 5 10 15

<210> 2613
<211> 16
<212> PRT
<213> Homo sapiens

<400> 2613

Val Tyr Ala Thr Arg Ser Ser Ala Val Arg Leu Arg Ser Ser Val Pro
1 5 10 15

<210> 2614
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2614

Tyr Thr Gln Lys His Lys His Gln Ala
1 5

<210> 2615
<211> 13
<212> PRT
<213> Bos taurus

<400> 2615

Ala Gly Phe Lys Gly Glu Gln Gly Pro Lys Gly Glu Pro
1 5 10

<210> 2616
<211> 11
<212> PRT
<213> Homo sapiens

<400> 2616

Ala Arg Gly Leu Thr Gly Arg Pro Gly Asp Ala
1 5 10

<210> 2617
<211> 15
<212> PRT
<213> Mus musculus

<400> 2617

Ala Thr Glu Gly Gln Val Arg Val Asn Ser Ile Tyr Gln Asp Lys
1 5 10 15

<210> 2618
<211> 15
<212> PRT
<213> Bos taurus

<400> 2618

Ala Thr Tyr Lys Arg Arg Leu Gln Lys Arg Ser Ser Arg Pro Leu
1 5 10 15

<210> 2619
<211> 21
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2619

Gly Glu Pro Gly Ile Ala Gly Phe Lys Gly Asp Gln Gly Pro Lys Gly
1 5 10 15

Glu Pro Gly Pro Ala
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<210> 2620
<211> 12
<212> PRT
<213> Rattus norvegicus

<400> 2620

Gly Ile Ala Gly Phe Lys Gly Glu Gln Gly Pro Lys
1   5   10

<210> 2621
<211> 15
<212> PRT
<213> Rattus norvegicus

<400> 2621

Gly Ile Ala Gly Phe Lys Gly Glu Gln Gly Pro Lys Gly Glu Thr
1   5   10   15

<210> 2622
<211> 8
<212> PRT
<213> Homo sapiens

<400> 2622

Leu Lys Phe Val Glu Gln Asn Glu
1   5

<210> 2623
<211> 15
<212> PRT
<213> Mus musculus

<400> 2623

Asn Thr Tyr Lys His Arg Leu Gln Lys Arg Thr Met Arg Pro Thr
1   5   10   15

<210> 2624
<211> 13
<212> PRT
<213> Homo sapiens

<400> 2624

Pro Thr Phe Gly Arg Ser Phe Thr Leu Ala Ser Ser Glu
1   5   10

<210> 2625
<211> 26
<212> PRT

<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2625

Pro Thr Gly Pro Leu Gly Pro Lys Gly Gln Thr Gly Glu Leu Gly Ala
1 5 10 15

Pro Gly Asn Lys Gly Glu Gln Gly Pro Lys
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<210> 2626
<211> 14
<212> PRT
<213> Homo sapiens

<400> 2626

Ser Gln Arg Phe Ser Lys Ile Ala Ser Asn Thr Gln Ser Arg
1 5 10

<210> 2627
<211> 15
<212> PRT
<213> Canis lupus

<400> 2627

Ser Thr Tyr Lys Arg Arg Leu Gln Lys Arg Ser Ser Arg Ala Pro
1 5 10 15

<210> 2628
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2628

Thr Gly Glu Pro Gly Ile Ala Gly Phe Lys Gly Glu Gln Gly Pro Lys
1 5 10 15

Gly Glu Pro Gly
20

<210> 2629
<211> 15
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2629

Thr Thr Tyr Lys Arg Arg Leu Gln Lys Arg Ala Ala Arg His Pro

1 5 10 15

<210> 2630
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2630

Thr Tyr Lys Arg Arg Leu Gln Lys Arg
1 5

<210> 2631
<211> 14
<212> PRT
<213> Sus scrofa

<400> 2631

Thr Tyr Lys Arg Arg Leu Gln Lys Arg Ser Ser Arg Ser Leu
1 5 10

<210> 2632
<211> 13
<212> PRT
<213> Homo sapiens

<400> 2632

Val Gly Tyr Asp Asp Gln Glu Ser Val Lys Ser Lys Val
1 5 10

<210> 2633
<211> 18
<212> PRT
<213> Homo sapiens

<400> 2633

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

Arg Tyr

<210> 2634
<211> 7
<212> PRT
<213> Homo sapiens

<400> 2634

Ala Leu Pro Ala Pro Ile Glu
1 5

<210> 2635

<211> 7
<212> PRT
<213> Homo sapiens

<400> 2635

Ala Pro Ile Glu Lys Thr Ile
1 5

<210> 2636
<211> 7
<212> PRT
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<400> 2636

Cys Lys Val Ser Asn Lys Ala
1 5

<210> 2637
<211> 7
<212> PRT
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<400> 2637

Asp Gly Lys Glu Tyr Lys Cys
1 5

<210> 2638
<211> 7
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<400> 2638

Asp Val Ser His Glu Asp Pro
1 5

<210> 2639
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<400> 2639

Glu Asp Pro Gln Val Lys Phe
1 5

<210> 2640
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<212> PRT
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<400> 2640

Glu Lys Thr Ile Ser Lys Ala
1 5

<210> 2641
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<212> PRT
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<400> 2641

Glu Gln Arg Arg Ala Ala
1 5

<210> 2642
<211> 7
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<213> Homo sapiens

<400> 2642

Glu Tyr Lys Cys Lys Val Ser
1 5

<210> 2643
<211> 7
<212> PRT
<213> Homo sapiens

<400> 2643

Phe Leu Phe Pro Pro Lys Pro
1 5

<210> 2644
<211> 7
<212> PRT
<213> Homo sapiens

<400> 2644

Phe Asn Trp Tyr Val Asp Gly
1 5

<210> 2645
<211> 7
<212> PRT
<213> Homo sapiens

<400> 2645

Phe Pro Pro Lys Pro Lys Asp
1 5

<210> 2646
<211> 16
<212> PRT
<213> Bos taurus

<400> 2646

Gly Ala Arg Gly Pro Glu Gly Ala Gln Gly Pro Arg Gly Glu Pro Gly
1 5 10 15

<210> 2647
<211> 15
<212> PRT
<213> Bos taurus

<400> 2647

Gly Glu Pro Gly Ile Ala Gly Phe Lys Gly Glu Gln Gly Pro Lys
1 5 10 15

<210> 2648
<211> 15
<212> PRT
<213> Rattus norvegicus

<400> 2648

Gly Glu Pro Gly Ile Ala Gly Phe Lys Gly Glu Gln Gly Pro Lys
1 5 10 15

<210> 2649
<211> 15
<212> PRT
<213> Rattus norvegicus

<400> 2649

Gly Glu Pro Gly Ile Ala Gly Phe Lys Gly Glu Gln Gly Pro Lys
1 5 10 15

<210> 2650
<211> 7
<212> PRT
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<400> 2650

Gly Lys Glu Tyr Lys Cys Lys
1 5

<210> 2651
<211> 16
<212> PRT
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<400> 2651

Gly Lys Pro Gly Ile Ala Gly Phe Lys Gly Glu Gln Gly Pro Lys Gly
1 5 10 15

<210> 2652
<211> 16
<212> PRT

<213> Homo sapiens

<400> 2652

Gly Asn Gln Trp Val Gly Tyr Asp Asp Gln Glu Ser Val Lys Ser Lys
1 5 10 15

<210> 2653
<211> 7
<212> PRT
<213> Homo sapiens

<400> 2653

Gly Pro Ser Val Phe Leu Phe
1 5

<210> 2654
<211> 11
<212> PRT
<213> Homo sapiens

<400> 2654

Gly Arg Gly Asp Ser Val Val Tyr Gly Leu Arg
1 5 10

<210> 2655
<211> 16
<212> PRT
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<400> 2655

Gly Arg Ser Phe Thr Leu Ala Ser Ser Glu Thr Gly Val Gly Ala Pro
1 5 10 15

<210> 2656
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2656

Gly Thr Ser Leu Thr Ile Pro Cys Tyr Phe Ile Asp Pro Met His
1 5 10 15

<210> 2657
<211> 7
<212> PRT
<213> Homo sapiens

<400> 2657

Gly Val Gln Val His Asn Ala
1 5

<210> 2658
<211> 7
<212> PRT
<213> Homo sapiens

<400> 2658

His Gln Asn Trp Leu Asp Gly
1 5

<210> 2659
<211> 7
<212> PRT
<213> Homo sapiens

<400> 2659

Ile Glu Lys Thr Ile Ser Lys
1 5

<210> 2660
<211> 7
<212> PRT
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<400> 2660

Ile Ser Lys Ala Lys Gly Gln
1 5

<210> 2661
<211> 7
<212> PRT
<213> Homo sapiens

<400> 2661

Lys Ala Leu Pro Ala Pro Ile
1 5

<210> 2662
<211> 7
<212> PRT
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<400> 2662

Lys Cys Lys Val Ser Asn Lys
1 5

<210> 2663
<211> 7
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<400> 2663

Lys Glu Tyr Lys Cys Lys Val

1 5

<210> 2664
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<212> PRT
<213> Homo sapiens

<400> 2664

Lys Phe Asn Trp Tyr Val Asp
1 5

<210> 2665
<211> 15
<212> PRT
<213> Gallus gallus

<400> 2665

Lys Gly Gln Thr Gly Glu Leu Gly Ile Ala Gly Phe Lys Gly Glu
1 5 10 15

<210> 2666
<211> 7
<212> PRT
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<400> 2666

Lys Pro Arg Glu Gln Gln Tyr
1 5

<210> 2667
<211> 7
<212> PRT
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<400> 2667

Lys Thr Ile Ser Lys Ala Lys
1 5

<210> 2668
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<400> 2668

Lys Thr Lys Pro Arg Glu Gln
1 5

<210> 2669
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<400> 2669

Lys Val Ser Asn Lys Ala Leu
1 5

<210> 2670
<211> 7
<212> PRT
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<400> 2670

Leu Asp Gly Lys Glu Tyr Lys
1 5

<210> 2671
<211> 7
<212> PRT
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<400> 2671

Leu Phe Pro Pro Lys Pro Lys
1 5

<210> 2672
<211> 33
<212> PRT
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<400> 2672

Leu Gly Pro Lys Gly Gln Thr Gly Glu Pro Gly Ile Ala Gly Phe Lys
1 5 10 15

Gly Glu Gln Gly Pro Lys Gly Glu Pro Gly Pro Ala Gly Pro Gln Gly
20 25 30

Ala

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<400> 2673

Leu His Gln Asn Trp Leu Asp
1 5

<210> 2674
<211> 7
<212> PRT
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<400> 2674

Leu Pro Ala Pro Ile Glu Lys
1 5

<210> 2675
<211> 7
<212> PRT
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<400> 2675

Leu Thr Val Leu His Gln Asn
1 5

<210> 2676
<211> 16
<212> PRT
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<400> 2676

Met Gly Ile Pro Thr Phe Gly Arg Ser Phe Thr Leu Ala Ser Ser Glu
1 5 10 15

<210> 2677
<211> 7
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<400> 2677

Asn Ala Lys Thr Lys Pro Arg
1 5

<210> 2678
<211> 16
<212> PRT
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<400> 2678

Asn Phe Gly Ser Gln Arg Phe Ser Lys Ile Ala Ser Asn Thr Gln Ser
1 5 10 15

<210> 2679
<211> 7
<212> PRT
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<400> 2679

Asn Lys Ala Leu Pro Ala Pro
1 5

<210> 2680
<211> 7

<212> PRT
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<400> 2680

Asn Ser Thr Tyr Arg Val Val
1 5

<210> 2681
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<212> PRT
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<400> 2681

Asn Trp Leu Asp Gly Lys Glu
1 5

<210> 2682
<211> 7
<212> PRT
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<400> 2682

Asn Trp Tyr Val Asp Gly Val
1 5

<210> 2683
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<400> 2683

Pro Ala Pro Ile Glu Lys Thr
1 5

<210> 2684
<211> 7
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<400> 2684

Pro Ile Glu Lys Thr Ile Ser
1 5

<210> 2685
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<212> PRT
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<400> 2685

Pro Gln Val Lys Phe Asn Trp
1 5

<210> 2686
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<400> 2686

Pro Arg Glu Gln Gln Tyr Asn
1 5

<210> 2687
<211> 7
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<400> 2687

Pro Ser Val Phe Leu Phe Pro
1 5

<210> 2688
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<212> PRT
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<400> 2688

Gln His Leu Asp Phe Ile Ser Ile Met Thr Tyr Asp Phe His Gly Ala
1 5 10 15

<210> 2689
<211> 7
<212> PRT
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<400> 2689

Gln Asn Trp Leu Asp Gly Lys
1 5

<210> 2690
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<212> PRT
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Gln Gln Tyr Asn Ser Thr Tyr
1 5

<210> 2691
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<400> 2691

Gln Val Lys Phe Asn Trp Tyr
1 5

<210> 2692
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<400> 2692

Gln Trp Val Gly Tyr Asp Asp Gln Glu Ser Val Lys Ser Lys Val Gln
1 5 10 15

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<211> 7
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<400> 2693

Gln Tyr Asn Ser Thr Tyr Arg
1 5

<210> 2694
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<400> 2694

Arg Glu Gln Gln Tyr Asn Ser
1 5

<210> 2695
<211> 7
<212> PRT
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<400> 2695

Arg Val Val Ser Val Leu Thr
1 5

<210> 2696
<211> 16
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<400> 2696

Ser Cys Phe Pro Asp Ala Leu Asp Arg Phe Leu Cys Thr His Ile Ile
1 5 10 15

<210> 2697
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<400> 2697

Ser Asn Lys Ala Leu Pro Ala
1 5

<210> 2698
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<400> 2698

Ser Val Phe Leu Phe Pro Pro
1 5

<210> 2699
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<400> 2699

Ser Val Leu Thr Val Leu His
1 5

<210> 2700
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<212> PRT
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<400> 2700

Thr Ile Ser Lys Ala Lys Gly
1 5

<210> 2701
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<212> PRT
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<400> 2701

Thr Val Leu His Gln Asn Trp
1 5

<210> 2702
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<400> 2702

Thr Tyr Arg Val Val Ser Val
1 5

<210> 2703

<211> 7
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<400> 2703

Val Asp Gly Val Gln Val His
1 5

<210> 2704
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<400> 2704

Val Phe Leu Phe Pro Pro Lys
1 5

<210> 2705
<211> 7
<212> PRT
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<400> 2705

Val His Asn Ala Lys Thr Lys
1 5

<210> 2706
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<400> 2706

Val Lys Phe Asn Trp Tyr Val
1 5

<210> 2707
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<400> 2707

Val Leu His Gln Asn Trp Leu
1 5

<210> 2708
<211> 7
<212> PRT
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<400> 2708

Val Ser Asn Lys Ala Leu Pro
1 5

<210> 2709
<211> 7
<212> PRT
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<400> 2709

Val Ser Val Leu Thr Val Leu
1 5

<210> 2710
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<212> PRT
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<400> 2710

Val Val Leu Leu Val Ala Thr Glu Gly Arg Val Arg Val Asn Ser Ala
1 5 10 15

Tyr Gln

<210> 2711
<211> 7
<212> PRT
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<400> 2711

Val Val Ser Val Leu Thr Val
1 5

<210> 2712
<211> 18
<212> PRT
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<400> 2712

Val Val Val Lys Gly Ile Val Phe His Tyr Arg Ala Ile Ser Thr Arg
1 5 10 15

Tyr Thr

<210> 2713
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<212> PRT
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<400> 2713

Trp Leu Asp Gly Lys Glu Tyr
1 5

<210> 2714
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<400> 2714

Trp Tyr Val Asp Gly Val Gln
1 5

<210> 2715
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<400> 2715

Tyr Lys Cys Lys Val Ser Asn
1 5

<210> 2716
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<400> 2716

Tyr Leu Ala Trp Gln Ala Gly Met Asp Met Cys Ser Ala Gly Trp
1 5 10 15

<210> 2717
<211> 7
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<400> 2717

Tyr Asn Ser Thr Tyr Arg Val
1 5

<210> 2718
<211> 7
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<400> 2718

Tyr Arg Val Val Ser Val Leu
1 5

<210> 2719
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<212> PRT
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<400> 2719

Tyr Val Asp Gly Val Gln Val
1 5

<210> 2720
<211> 9
<212> PRT
<213> Human herpesvirus

<400> 2720

Ala Ala Arg Gln Arg Leu Gln Asp Ile
1 5

<210> 2721
<211> 13
<212> PRT
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<400> 2721

Ala Gly Trp Leu Ala Asp Gly Ser Leu Arg Tyr Pro Ile
1 5 10

<210> 2722
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<400> 2722

Ala Gly Trp Leu Ala Asp Gln Thr Val Arg Tyr Pro Ile
1 5 10

<210> 2723
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<400> 2723

Ala Arg Gly Ala Gln Gly Pro Pro Gly Ala Thr Gly Phe Pro
1 5 10

<210> 2724
<211> 18
<212> PRT
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<400> 2724

Ala Thr Leu Glu Val Gln Ser Leu Arg Ser Asn Asp Ser Gly Val Tyr
1 5 10 15

Arg Cys

<210> 2725
<211> 10
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<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2725

Ala Trp Asn Cys Cys Val Lys Gln Thr Pro
1 5 10

<210> 2726
<211> 20
<212> PRT
<213> Mycobacterium tuberculosis

<400> 2726

Ala Tyr Asp Glu Glu Ala Arg Arg Gly Leu Glu Arg Gly Leu Asn Ala
1 5 10 15

Leu Ala Asp Ala
20

<210> 2727
<211> 9
<212> PRT
<213> Human herpesvirus

<400> 2727

Cys Leu Gly Gly Leu Leu Thr Met Asn
1 5

<210> 2728
<211> 7
<212> PRT
<213> Homo sapiens

<400> 2728

Cys Ser Val Met His Glu Gly
1 5

<210> 2729
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<400> 2729

Asp Ala Gly Pro Gln Gly Lys Val Gly Pro Ser
1 5 10

<210> 2730
<211> 7
<212> PRT
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<400> 2730

Asp Gly Ser Phe Phe Leu Tyr
1 5

<210> 2731
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<400> 2731

Asp Ser Gly His Arg Gly Tyr Ser Gly Ser Gln Ala Ser Asp Asn Glu
1 5 10 15

Gly His

<210> 2732
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<212> PRT
<213> Porphyromonas gingivalis

<400> 2732

Asp Ser Arg Gly Asn Pro Thr Val Glu
1 5

<210> 2733
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<400> 2733

Glu Gly Leu His Asn His Tyr
1 5

<210> 2734
<211> 11
<212> PRT
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<400> 2734

Glu Arg Gly Leu Lys Gly His Arg Gly Phe Thr
1 5 10

<210> 2735
<211> 11
<212> PRT
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<400> 2735

Gly Gly Gln Gly Ser Arg His Gln Gln Ala Arg
1 5 10

<210> 2736
<211> 14
<212> PRT
<213> Homo sapiens

<400> 2736

Gly Gly Val Gly Pro Ile Gly Pro Pro Gly Glu Arg Gly Ala
1 5 10

<210> 2737
<211> 9
<212> PRT
<213> Bos taurus

<400> 2737

Gly Pro Ala Gly Pro Ala Gly Glu Arg
1 5

<210> 2738
<211> 9
<212> PRT
<213> Human herpesvirus

<400> 2738

Gly Pro Lys Val Lys Arg Pro Pro Ile
1 5

<210> 2739
<211> 11
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2739

Gly Trp Val Ala Met His Pro Gln Gly Asp Leu
1 5 10

<210> 2740
<211> 21
<212> PRT
<213> Homo sapiens

<400> 2740

His Gln Cys His Gln Glu Ser Thr Arg Gly Arg Ser Arg Gly Arg Cys
1 5 10 15

Gly Arg Ser Gly Ser
20

<210> 2741
<211> 18
<212> PRT
<213> Homo sapiens

<400> 2741

His Ser Ala Ser Gln Asp Gly Gln Asp Thr Ile Arg Gly His Pro Gly
1 5 10 15

Ser Ser

<210> 2742
<211> 22
<212> PRT
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<400> 2742

His Ser Gly Ile Gly His Gly Gln Ala Ser Ser Ala Val Arg Asp Ser
1 5 10 15

Gly His Arg Gly Tyr Ser
20

<210> 2743
<211> 17
<212> PRT
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<400> 2743

His Ser Thr Ser Gln Glu Gly Gln Asp Thr Ile His Gly His Arg Gly
1 5 10 15

Ser

<210> 2744
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<212> PRT
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<400> 2744

Lys Ser Leu Ser Leu Ser Pro
1 5

<210> 2745

<211> 20
<212> PRT
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<400> 2745

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

Lys Gly Asp Ile
20

<210> 2746
<211> 10
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2746

Leu Gly Trp Met Arg Tyr His Pro Gln Ala
1 5 10

<210> 2747
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<212> PRT
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<400> 2747

Leu Leu Asp Phe Val Arg Phe Met Gly Tyr
1 5 10

<210> 2748
<211> 10
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2748

Leu Leu Pro Trp Leu Asp Gly His Pro Met
1 5 10

<210> 2749
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<212> PRT
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<400> 2749

Leu Leu Arg Gly Tyr His Gln Asp Ala Tyr
1 5 10

<210> 2750
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<212> PRT
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<400> 2750

Leu Val Gly Pro Arg Gly Glu Arg Gly Phe Pro
1 5 10

<210> 2751
<211> 10
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2751

Asn Trp Leu Ser Leu Ile Thr Ala Ala Arg
1 5 10

<210> 2752
<211> 13
<212> PRT
<213> Homo sapiens

<400> 2752

Pro Glu Phe Ser Gly Leu Pro Ser Gly Ile Ala Glu Val
1 5 10

<210> 2753
<211> 15
<212> PRT
<213> Mus musculus

<400> 2753

Pro Pro Gly Ala Asn Gly Asn Pro Gly Pro Ala Gly Pro Pro Gly
1 5 10 15

<210> 2754
<211> 9
<212> PRT
<213> Homo sapiens

<400> 2754

Pro Pro Gly Pro Thr Gly Ala Ser Gly
1 5

<210> 2755
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<212> PRT
<213> Homo sapiens

<400> 2755

Pro Gln Val Tyr Thr Leu Pro
1 5

<210> 2756
<211> 7
<212> PRT
<213> Homo sapiens

<400> 2756

Pro Arg Glu Pro Gln Val Tyr
1 5

<210> 2757
<211> 11
<212> PRT
<213> Homo sapiens

<400> 2757

Gln Gly Lys Val Gly Pro Ser Gly Ala Pro Gly
1 5 10

<210> 2758
<211> 9
<212> PRT
<213> Human herpesvirus

<400> 2758

Gln Leu Leu Gln His Tyr Arg Glu Val
1 5

<210> 2759
<211> 18
<212> PRT
<213> Homo sapiens

<400> 2759

Arg Gly Phe Thr Gly Leu Gln Gly Leu Pro Gly Pro Pro Gly Pro Ser
1 5 10 15

Gly Asp

<210> 2760
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2760

Arg Arg Leu Pro Phe Gly Ser Gln Met
1 5

<210> 2761
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2761

Arg Val Ala Glu Gln Leu Arg Ala Tyr Leu Glu Gly Glu Cys Val
1 5 10 15

<210> 2762
<211> 19
<212> PRT
<213> Homo sapiens

<400> 2762

Ser Gly Phe Gln Gly Leu Pro Gly Pro Pro Gly Pro Pro Gly Glu Gly
1 5 10 15

Gly Gly Lys

<210> 2763
<211> 19
<212> PRT
<213> Homo sapiens

<400> 2763

Ser His Gln Glu Ser Thr Arg Gly Arg Ser Arg Gly Arg Ser Gly Arg
1 5 10 15

Ser Gly Ser

<210> 2764
<211> 10
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2764

Ser Ile Phe Phe Ala Val Val Leu Glu Leu
1 5 10

<210> 2765
<211> 10

<212> PRT
<213> Unknown

<220>
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<400> 2765

Ser Leu Cys Ile Asn Leu Arg Ala Ala Arg
1 5 10

<210> 2766
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<213> Unknown

<220>
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<400> 2766

Ser Leu Ile Thr Ala Ala Arg Gly Ala Pro Ser
1 5 10

<210> 2767
<211> 17
<212> PRT
<213> Homo sapiens

<400> 2767

Ser Met Asn Val Glu Val Thr Asp Lys Gly Asp Val Pro Glu Gly Tyr
1 5 10 15

Lys

<210> 2768
<211> 17
<212> PRT
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<400> 2768

Ser Gln Ile Val Asn Asp Phe Gln Lys Gly Asp Ile Ala Glu Gly Tyr
1 5 10 15

Ser

<210> 2769
<211> 10
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2769

Val Asp Leu Met Thr Ile Arg Ser Cys Arg
1 5 10

<210> 2770
<211> 9
<212> PRT
<213> Human herpesvirus

<400> 2770

Val Met Ala Thr Leu Leu Pro Pro Val
1 5

<210> 2771
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<212> PRT
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<400> 2771

Trp Asp Arg Glu Thr Gln Ile Cys Lys Ala Lys Ala Gln
1 5 10

<210> 2772
<211> 10
<212> PRT
<213> Unknown

<220>
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<400> 2772

Trp Phe Thr Ser Trp Glu Arg Asp Trp Trp
1 5 10

<210> 2773
<211> 10
<212> PRT
<213> Unknown

<220>
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<400> 2773

Trp Pro Pro Ser Phe Trp Tyr His Pro Gln
1 5 10

<210> 2774
<211> 10
<212> PRT
<213> Unknown

<220>

<223> epitope involved in rheumatoid arthritis

<400> 2774

Trp Val Ala Met His Pro Gln Gly Asp Leu
1 5 10

<210> 2775
<211> 10
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2775

Trp Trp Ala Thr Phe Phe Glu Ala Thr Arg
1 5 10

<210> 2776
<211> 10
<212> PRT
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<220>
<223> epitope involved in rheumatoid arthritis

<400> 2776

Trp Trp Asn Met Phe Gln Met Gly Val Val
1 5 10

<210> 2777
<211> 9
<212> PRT
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<220>
<223> epitope involved in rheumatoid arthritis

<400> 2777

Ala Ala Phe Ser Glu Leu Pro Leu Gly
1 5

<210> 2778
<211> 9
<212> PRT
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<220>
<223> epitope involved in rheumatoid arthritis

<400> 2778

Ala Asp Ala Ser Val Pro Val Met Pro
1 5

<210> 2779
<211> 15
<212> PRT
<213> Bos taurus

<400> 2779

Ala Gly Phe Lys Gly Glu Gln Gly Pro Lys Gly Glu Pro Gly Pro
1 5 10 15

<210> 2780
<211> 18
<212> PRT
<213> Homo sapiens

<400> 2780

Ala Gly Phe Lys Gly Glu Gln Gly Pro Lys Gly Glu Pro Gly Pro Ala
1 5 10 15

Gly Pro

<210> 2781
<211> 18
<212> PRT
<213> Homo sapiens

<400> 2781

Ala Gly Phe Lys Gly Glu Gln Gly Pro Lys Gly Glu Pro Gly Pro Ala
1 5 10 15

Gly Pro

<210> 2782
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2782

Ala Lys Tyr Ser Asn Gln Arg Ala Gln
1 5

<210> 2783
<211> 9
<212> PRT
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<220>
<223> epitope involved in rheumatoid arthritis

<400> 2783

Ala Leu Ala Arg Leu Met Pro Gly Ser
1 5

<210> 2784
<211> 9
<212> PRT
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<220>
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<400> 2784

Ala Pro Arg Arg Leu Phe Asp Ile Ala
1 5

<210> 2785
<211> 9
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<220>
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<400> 2785

Ala Pro Ser Ser Leu Ala Gly Asn Gly
1 5

<210> 2786
<211> 9
<212> PRT
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<220>
<223> epitope involved in rheumatoid arthritis

<400> 2786

Ala Gln Ala Tyr Asp Leu Ser Pro Ser
1 5

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<211> 9
<212> PRT
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<220>
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<400> 2787

Ala Gln Ser Ala Ile Thr Ala Cys Trp
1 5

<210> 2788
<211> 9
<212> PRT
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<220>
<223> epitope involved in rheumatoid arthritis

<400> 2788

Ala Ser Lys Ala Lys Ala Arg Pro Val
1 5

<210> 2789
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2789

Ala Thr Ala Asp Tyr Pro Gln Lys Ser
1 5

<210> 2790
<211> 9
<212> PRT
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<220>
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<400> 2790

Ala Thr Asn Ile Phe Ile Glu Gly Thr
1 5

<210> 2791
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2791

Cys Thr Arg His Pro Asp Cys Gln Ala
1 5

<210> 2792
<211> 16
<212> PRT
<213> Homo sapiens

<400> 2792

Asp Asp Thr Gln Phe Val Arg Phe Asp Ser Asp Ala Ala Ser Pro Arg
1 5 10 15

<210> 2793
<211> 16
<212> PRT
<213> Homo sapiens

<400> 2793

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

<210> 2794
<211> 17
<212> PRT
<213> Homo sapiens

<400> 2794

Asp Leu Ser Ser Trp Thr Ala Ala Asp Thr Ala Ala Gln Ile Thr Gln
1 5 10 15

Arg

<210> 2795
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2795

Asp Asn Pro Glu Tyr Ser Pro Asp Pro Ser Ile Tyr Ala Tyr Asp
1 5 10 15

<210> 2796
<211> 18
<212> PRT
<213> Bos taurus

<400> 2796

Glu Pro Gly Ile Ala Gly Phe Lys Gly Glu Gln Gly Pro Lys Gly Glu
1 5 10 15

Pro Gly

<210> 2797
<211> 9
<212> PRT
<213> Unknown

<220>
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<400> 2797

Glu Gln Ala Gln Ser Gln Thr Leu Pro
1 5

<210> 2798
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2798

Glu Val Ala His Pro Ser Val Pro Leu
1 5

<210> 2799
<211> 15
<212> PRT
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<400> 2799

Phe Glu Asp Met Ala Lys Ser Asp Lys Ala Arg Tyr Asp Arg Glu
1 5 10 15

<210> 2800
<211> 17
<212> PRT
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<400> 2800

Phe Leu Ala Glu Gly Gly Gly Val Arg Gly Pro Arg Val Val Glu Arg
1 5 10 15

His

<210> 2801
<211> 12
<212> PRT
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<400> 2801

Phe Val Arg Phe Asp Ser Asp Ala Ala Ser Pro Arg
1 5 10

<210> 2802
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<212> PRT
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<400> 2802

Phe Val Arg Phe Asp Ser Asp Ala Ala Ser Gln
1 5 10

<210> 2803
<211> 13
<212> PRT
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<400> 2803

Phe Val Arg Phe Asp Ser Asp Ala Ala Ser Gln Arg Met
1 5 10

<210> 2804
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<212> PRT
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<220>
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<400> 2804

Gly Ala Ser Gly Asp Ile Ala Lys Gln
1 5

<210> 2805
<211> 9
<212> PRT
<213> Unknown

<220>
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<400> 2805

Gly Gly Glu Thr Leu Leu His Met Ala
1 5

<210> 2806
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2806

Gly Ile Ala Gly Phe Lys Gly Glu Gln Gly Pro Lys Gly Glu Pro
1 5 10 15

<210> 2807
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2807

Gly Ile Ala Gly Phe Lys Gly Glu Gln Gly Pro Lys Gly Glu Pro
1 5 10 15

<210> 2808
<211> 15
<212> PRT
<213> Rattus norvegicus

<400> 2808

Gly Ile Ala Gly Phe Lys Gly Glu Gln Gly Pro Lys Gly Glu Thr
1 5 10 15

<210> 2809
<211> 15
<212> PRT
<213> Bos taurus

<400> 2809

Gly Pro Glu Gly Ala Gln Gly Pro Arg Gly Glu Pro Gly Thr Pro
1 5 10 15

<210> 2810
<211> 9
<212> PRT
<213> Unknown

<220>
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<400> 2810

Gly Pro Pro Arg Arg Leu Ile Asp Thr
1 5

<210> 2811
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2811

Gly Arg Thr Pro Glu Asp Asn Thr Leu
1 5

<210> 2812
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2812

Gly Trp Pro Val Ala Pro Asp Pro Ala
1 5

<210> 2813
<211> 9
<212> PRT
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<220>
<223> epitope involved in rheumatoid arthritis

<400> 2813

His Ala Lys Lys Thr Pro Pro Ala Ser
1 5

<210> 2814
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2814

His Glu Leu Gly Asp Ile Ala Ile Ala
1 5

<210> 2815
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2815

His Leu Arg Gln Gly Arg Asn Thr Ala
1 5

<210> 2816
<211> 21
<212> PRT
<213> Unknown

<220>
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His Gln Cys His Gln Glu Ser Thr Arg Gly Arg Ser Arg Gly Arg Cys
1 5 10 15

Gly Arg Ser Gly Ser
20

<210> 2817
<211> 9
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<220>
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<400> 2817

Ile Arg Arg Ser Glu Thr Pro Arg Ala
1 5

<210> 2818
<211> 9
<212> PRT
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<220>
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<400> 2818

Ile Arg Tyr His Thr Asn Trp Ser Ser
1 5

<210> 2819
<211> 19
<212> PRT
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<400> 2819

Ile Tyr Phe Arg Asn Gln Lys Gly His Ser Gly Leu Gln Pro Thr Gly
1 5 10 15

Phe Leu Ser

<210> 2820
<211> 19
<212> PRT
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<400> 2820

Ile Tyr Phe Arg Asn Gln Lys Gly His Ser Gly Leu Gln Pro Thr Gly
1 5 10 15

Leu Leu Ser

<210> 2821
<211> 15
<212> PRT

<213> Homo sapiens

<400> 2821

Lys Glu Lys Ser Lys Phe Glu Asp Met Ala Lys Ser Asp Lys Ala
1 5 10 15

<210> 2822
<211> 15
<212> PRT
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<400> 2822

Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser
1 5 10 15

<210> 2823
<211> 16
<212> PRT
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<400> 2823

Lys Ile His Ala Arg Glu Ile Phe Asp Ser Arg Gly Asn Pro Thr Val
1 5 10 15

<210> 2824
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<400> 2824

Lys Lys Gly Lys Lys Lys Asp Pro Asn Ala Pro Lys Arg Pro Pro
1 5 10 15

<210> 2825
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<212> PRT
<213> Unknown

<220>
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<400> 2825

Lys Met Pro Ile Glu Ala Asp Pro Leu
1 5

<210> 2826
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<212> PRT
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<400> 2826

Lys Ser Asp Lys Ala Arg Tyr Asp Arg Glu Met Lys Asn Tyr Val

1 5 10 15

<210> 2827
<211> 9
<212> PRT
<213> Unknown

<220>
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<400> 2827

Lys Ser Gly Pro Ile Asp Ile Ile Gly
1 5

<210> 2828
<211> 15
<212> PRT
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<400> 2828

Lys Thr Met Ser Ala Lys Glu Lys Ser Lys Phe Glu Asp Met Ala
1 5 10 15

<210> 2829
<211> 9
<212> PRT
<213> Unknown

<220>
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<400> 2829

Leu Gly Leu His Ala Leu Gln Ser Pro
1 5

<210> 2830
<211> 9
<212> PRT
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<220>
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<400> 2830

Leu Gly Arg Asp Ala Asn Ala Trp Lys
1 5

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<212> PRT
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<220>
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<400> 2831

Leu Leu Arg Pro Val Ala Arg Asp Thr
1 5

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<211> 9
<212> PRT
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<220>
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<400> 2832

Leu Asn Thr Ala Lys His Arg Glu Ser
1 5

<210> 2833
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<212> PRT
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<400> 2833

Leu Pro Ser Tyr Glu Glu Ala Leu Ser Leu Pro Ser Lys
1 5 10

<210> 2834
<211> 9
<212> PRT
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<220>
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<400> 2834

Leu Ser Arg Ala Ser Leu Lys Thr Leu
1 5

<210> 2835
<211> 15
<212> PRT
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<400> 2835

Leu Ser Ser Trp Thr Ala Ala Asp Thr Ala Ala Gln Ile Thr Gln
1 5 10 15

<210> 2836
<211> 9
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<220>

<223> epitope involved in rheumatoid arthritis

<400> 2836

Leu Val Gly Thr Pro Gln Lys Thr Lys
1 5

<210> 2837
<211> 15
<212> PRT
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<400> 2837

Met Lys Asn Tyr Val Pro Pro Lys Gly Asp Lys Lys Gly Lys Lys
1 5 10 15

<210> 2838
<211> 9
<212> PRT
<213> Unknown

<220>
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<400> 2838

Asn Lys Ala Leu Thr Phe Phe Leu Pro
1 5

<210> 2839
<211> 9
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<220>
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<400> 2839

Asn Leu Phe Thr Gln Thr Gly Thr Pro
1 5

<210> 2840
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<212> PRT
<213> Unknown

<220>
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<400> 2840

Asn Asn Ser Phe Glu Lys Val Lys Gln
1 5

<210> 2841
<211> 9

<212> PRT
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<220>
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<400> 2841

Asn Ser Ser Pro Tyr Leu Asn Thr Lys
1 5

<210> 2842
<211> 9
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<220>
<223> epitope involved in rheumatoid arthritis

<400> 2842

Pro Asp His Leu Pro Arg His Val Ser
1 5

<210> 2843
<211> 9
<212> PRT
<213> Unknown

<220>
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<400> 2843

Pro Glu Ile Ile Glu Asn Phe Asp Pro
1 5

<210> 2844
<211> 9
<212> PRT
<213> Unknown

<220>
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<400> 2844

Pro Leu Thr Asn Arg Arg Leu Arg Gly
1 5

<210> 2845
<211> 15
<212> PRT
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<400> 2845

Pro Pro Lys Gly Asp Lys Lys Gly Lys Lys Lys Asp Pro Asn Ala
1 5 10 15

<210> 2846
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<212> PRT
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<220>
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<400> 2846

Pro Pro Leu Leu Leu Thr Asp Val Thr
1 5

<210> 2847
<211> 9
<212> PRT
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<220>
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<400> 2847

Pro Gln Ser Pro Gly Ser Ser Phe Pro
1 5

<210> 2848
<211> 9
<212> PRT
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<220>
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<400> 2848

Pro Ser Phe Pro Pro Ala Leu Arg Leu
1 5

<210> 2849
<211> 9
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<220>
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<400> 2849

Pro Val Ser Ser Thr Arg Gly Asn Met
1 5

<210> 2850
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<220>
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<400> 2850

Pro Tyr Pro Phe Ala Gln Lys Arg Leu
1   5

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<220>
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<400> 2851

Gln Ser Pro Arg Leu Tyr Pro Gly Ser
1   5

<210> 2852
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<212> PRT
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<220>
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<400> 2852

Arg Gly Gly Ile Arg Arg Gln Ser Leu
1   5

<210> 2853
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<212> PRT
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<220>
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<400> 2853

Arg Lys Ala Leu Arg Leu Ser Ala Ser
1   5

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<220>
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Arg Pro Pro His Ser Ala Ser Trp Arg
1   5

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<220>
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<400> 2855

Arg Arg Gly Pro Glu Ala His Gln Ala
1 5

<210> 2856
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<220>
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<400> 2856

Arg Arg Arg Val Arg Asn Ser Asp Thr
1 5

<210> 2857
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<212> PRT
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<400> 2857

Arg Tyr Asp Arg Glu Met Lys Asn Tyr Val Pro Pro Lys Gly Asp
1 5 10 15

<210> 2858
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<220>
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<400> 2858

Ser Glu Ser Thr Ile Gln Asn Leu Arg
1 5

<210> 2859
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<400> 2859

Ser His Gln Glu Ser Thr Arg Gly Arg Ser Arg Gly Arg Ser

1 5 10

<210> 2860
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<400> 2860

Ser His Gln Glu Ser Thr Arg Gly Arg Ser Arg Gly Arg Ser Gly Arg
1 5 10 15

Ser Gly Ser

<210> 2861
<211> 19
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<400> 2861

Ser His Gln Glu Ser Thr Arg Gly Arg Ser Arg Gly Arg Ser Gly Arg
1 5 10 15

Ser Gly Ser

<210> 2862
<211> 19
<212> PRT
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<400> 2862

Ser His Gln Glu Ser Thr Arg Gly Arg Ser Arg Gly Arg Ser Gly Arg
1 5 10 15

Ser Gly Ser

<210> 2863
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<400> 2863

Ser His Gln Glu Ser Thr Arg Gly Arg Ser Arg Gly Arg Ser Gly Arg
1 5 10 15

Ser Gly Ser

<210> 2864
<211> 19
<212> PRT
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<400> 2864

Ser His Gln Glu Ser Thr Arg Gly Arg Ser Arg Gly Arg Ser Gly Arg
1 5 10 15

Ser Gly Ser

<210> 2865
<211> 19
<212> PRT
<213> Homo sapiens

<400> 2865

Ser His Gln Glu Ser Thr Arg Gly Arg Ser Arg Gly Arg Ser Gly Arg
1 5 10 15

Ser Gly Ser

<210> 2866
<211> 19
<212> PRT
<213> Homo sapiens

<400> 2866

Ser His Gln Glu Ser Thr Arg Gly Arg Ser Arg Gly Arg Ser Gly Arg
1 5 10 15

Ser Gly Ser

<210> 2867
<211> 19
<212> PRT
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<400> 2867

Ser His Gln Glu Ser Thr Arg Gly Arg Ser Arg Gly Arg Ser Gly Arg
1 5 10 15

Ser Gly Ser

<210> 2868
<211> 9
<212> PRT

<213> Unknown

<220>
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<400> 2868

Ser Thr Leu Val Pro Asn Lys Ala Pro
1 5

<210> 2869
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<400> 2869

Ser Thr Arg Ser Val Ser Ser Ser Ser Tyr Arg Arg Met Phe Gly Gly
1 5 10 15

<210> 2870
<211> 9
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<220>
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<400> 2870

Thr Phe Arg Asp Leu His Gln Gln Gln
1 5

<210> 2871
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<400> 2871

Thr Gly Pro Ser Thr Arg Gly Arg Gln Gly Ser Arg His Glu
1 5 10

<210> 2872
<211> 17
<212> PRT
<213> Homo sapiens

<400> 2872

Thr Gly Pro Ser Thr Arg Gly Arg Gln Gly Ser Arg His Glu Gln Ala
1 5 10 15

Gln

<210> 2873

<211> 17
<212> PRT
<213> Homo sapiens

<400> 2873

Thr Gly Pro Ser Thr Arg Gly Arg Gln Gly Ser Arg His Glu Gln Ala
1 5 10 15

Gln

<210> 2874
<211> 18
<212> PRT
<213> Homo sapiens

<400> 2874

Thr Ile His Ala His Pro Gly Ser Arg Arg Gly Gly Arg His Gly Tyr
1 5 10 15

His His

<210> 2875
<211> 10
<212> PRT
<213> Unknown

<220>
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<400> 2875

Thr Leu Thr Phe Thr Leu Asn Lys Leu Arg
1 5 10

<210> 2876
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2876

Thr Pro Asp Ser Leu Gly Arg Pro Ser
1 5

<210> 2877
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<400> 2877

Val Asp Asp Thr Gln Phe Val Arg Phe Asp Ser Asp Ala Ala Ser Pro
1 5 10 15

Arg

<210> 2878
<211> 21
<212> PRT
<213> Homo sapiens

<400> 2878

Val Asp Asp Thr Gln Phe Val Arg Phe Asp Ser Asp Ala Ala Ser Pro
1 5 10 15

Arg Gly Glu Pro Arg
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<210> 2879
<211> 9
<212> PRT
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<220>
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<400> 2879

Val Pro Val Asp Ala Gly Thr Ala Lys
1 5

<210> 2880
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2880

Tyr Lys Leu Arg Arg Ala Tyr Tyr Ala
1 5

<210> 2881
<211> 9
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<220>
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<400> 2881

Tyr Thr Leu Gln Lys Ala Val Leu Ser

1 5

<210> 2882
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<212> PRT
<213> Rattus norvegicus

<400> 2882

Ala Arg Gly Leu Thr Gly Arg Pro Gly Asp Ala
1 5 10

<210> 2883
<211> 16
<212> PRT
<213> Homo sapiens

<400> 2883

Cys Lys Pro Ile Ser Gly His Asn Ser Leu Phe Trp Tyr Arg Gln Thr
1 5 10 15

<210> 2884
<211> 16
<212> PRT
<213> Homo sapiens

<400> 2884

Asp Ala Gly Val Ile Gln Ser Pro Arg His Glu Val Thr Glu Met Gly
1 5 10 15

<210> 2885
<211> 7
<212> PRT
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<400> 2885

Asp Glu Leu Thr Lys Asn Gln
1 5

<210> 2886
<211> 7
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<400> 2886

Asp Lys Ser Arg Trp Gln Glu
1 5

<210> 2887
<211> 10
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<400> 2887

Asp Pro Ile Ser Gly His Val Ser Leu Phe
1 5 10

<210> 2888
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<212> PRT
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<400> 2888

Asp Ser Asp Gly Ser Phe Phe
1 5

<210> 2889
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<400> 2889

Glu Ala Leu His Asn His Tyr Gln Lys Ser
1 5 10

<210> 2890
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<400> 2890

Glu Gly Asn Val Phe Ser Cys
1 5

<210> 2891
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<400> 2891

Glu Asn Tyr Lys Thr Thr Pro
1 5

<210> 2892
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<400> 2892

Glu Pro Gln Val Tyr Thr Leu
1 5

<210> 2893
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<212> PRT
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<400> 2893

Glu Trp Gly Ser Asn Asp Gly
1 5

<210> 2894
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<400> 2894

Phe Phe Leu Tyr Ser Lys Leu
1 5

<210> 2895
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<400> 2895

Phe Leu Tyr Ser Lys Leu Thr
1 5

<210> 2896
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<212> PRT
<213> Bos taurus

<400> 2896

Gly Glu Arg Gly Ser Pro Gly Ala Val Gly Pro Lys Gly Ser Pro
1 5 10 15

<210> 2897
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<212> PRT
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<400> 2897

Gly Leu His Asn His Tyr Thr
1 5

<210> 2898
<211> 7
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<400> 2898

Gly Asn Val Phe Ser Cys Ser
1 5

<210> 2899
<211> 15
<212> PRT
<213> Bos taurus

<400> 2899

Gly Pro Thr Gly Ala Arg Gly Pro Glu Gly Ala Gln Gly Pro Arg
1 5 10 15

<210> 2900
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<212> PRT
<213> Homo sapiens

<400> 2900

Gly Gln Pro Arg Glu Pro Gln
1 5

<210> 2901
<211> 15
<212> PRT
<213> Bos taurus

<400> 2901

Gly Ser Ala Gly Ala Pro Gly Ile Ala Gly Ala Pro Gly Phe Pro
1 5 10 15

<210> 2902
<211> 7
<212> PRT
<213> Homo sapiens

<400> 2902

Gly Ser Phe Phe Leu Tyr Ser
1 5

<210> 2903
<211> 7
<212> PRT
<213> Homo sapiens

<400> 2903

His Glu Gly Leu His Asn His
1 5

<210> 2904
<211> 8
<212> PRT
<213> Rattus norvegicus

<400> 2904

Ile Ala Gly Phe Lys Gly Glu Gln
1   5

<210> 2905
<211> 16
<212> PRT
<213> Homo sapiens

<400> 2905

Lys Ile Gln Pro Ser Glu Pro Arg Asp Ser Ala Val Tyr Phe Cys Ala
1   5   10   15

<210> 2906
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<212> PRT
<213> Homo sapiens

<400> 2906

Lys Asn Gln Val Ser Leu Thr
1   5

<210> 2907
<211> 10
<212> PRT
<213> Homo sapiens

<400> 2907

Lys Pro Ile Ser Gly His Asn Ser Leu Phe
1   5   10

<210> 2908
<211> 7
<212> PRT
<213> Homo sapiens

<400> 2908

Lys Ser Arg Trp Gln Glu Gly
1   5

<210> 2909
<211> 7
<212> PRT
<213> Homo sapiens

<400> 2909

Leu Asp Ser Asp Gly Ser Phe
1   5

<210> 2910
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<212> PRT
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<400> 2910

Leu His Asn His Tyr Thr Gln
1 5

<210> 2911
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<400> 2911

Leu Thr Lys Asn Gln Val Ser
1 5

<210> 2912
<211> 11
<212> PRT
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<400> 2912

Leu Val Gly Pro Arg Gly Glu Arg Gly Phe Pro
1 5 10

<210> 2913
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<212> PRT
<213> Homo sapiens

<400> 2913

Met His Glu Gly Leu His Asn
1 5

<210> 2914
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<212> PRT
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<400> 2914

Met Pro Gly Glu Arg Gly Ala Ala Gly Ile Ala Gly Pro Lys
1 5 10

<210> 2915
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<400> 2915

Asn Gln Val Ser Leu Thr Cys
1 5

<210> 2916

<211> 7
<212> PRT
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<400> 2916

Asn Val Phe Ser Cys Ser Val
1 5

<210> 2917
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<400> 2917

Asn Tyr Lys Thr Thr Pro Pro
1 5

<210> 2918
<211> 7
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<400> 2918

Pro Pro Ser Arg Asp Glu Leu
1 5

<210> 2919
<211> 7
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<400> 2919

Pro Pro Ser Arg Glu Glu Met
1 5

<210> 2920
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<212> PRT
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<400> 2920

Pro Ser Arg Asp Glu Leu Thr
1 5

<210> 2921
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<400> 2921

Pro Ser Arg Glu Glu Met Thr
1 5

<210> 2922
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<212> PRT
<213> Homo sapiens

<400> 2922

Gln Lys Ser Leu Ser Leu Ser
1 5

<210> 2923
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<212> PRT
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<400> 2923

Gln Pro Leu Lys Glu Gln Pro Ala Leu Asn Asp Ser Arg Tyr Cys Leu
1 5 10 15

<210> 2924
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<212> PRT
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<400> 2924

Gln Pro Arg Glu Pro Gln Val
1 5

<210> 2925
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<212> PRT
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<400> 2925

Gln Val Ser Leu Thr Cys Leu
1 5

<210> 2926
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<212> PRT
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<400> 2926

Gln Val Tyr Thr Leu Pro Pro
1 5

<210> 2927
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<212> PRT
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<400> 2927

Arg Glu Pro Gln Val Tyr Thr
1 5

<210> 2928
<211> 21
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<213> Mus musculus

<400> 2928

Arg Gly Phe Gly Phe Val Thr Phe Ser Ser Met Ala Glu Val Asp Ala
1 5 10 15

Ala Met Ala Ala Arg
20

<210> 2929
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<212> PRT
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<400> 2929

Arg Ser Leu Asp Phe Gln Ala Thr Thr Met Phe
1 5 10

<210> 2930
<211> 7
<212> PRT
<213> Homo sapiens

<400> 2930

Arg Trp Gln Glu Gly Asn Val
1 5

<210> 2931
<211> 16
<212> PRT
<213> Homo sapiens

<400> 2931

Ser Ala Thr Phe Trp Gln Asn Pro Arg Asn His Phe Arg Cys Gln Val
1 5 10 15

<210> 2932
<211> 7
<212> PRT
<213> Homo sapiens

<400> 2932

Ser Cys Ser Val Met His Glu
1 5

<210> 2933
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<212> PRT
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<400> 2933

Ser Asp Gly Ser Phe Phe Leu
1 5

<210> 2934
<211> 7
<212> PRT
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<400> 2934

Ser Phe Phe Leu Tyr Ser Lys
1 5

<210> 2935
<211> 27
<212> PRT
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<400> 2935

Ser Gly Lys Pro Gly Ala His Val Thr Val Lys Lys Leu Phe Val Gly
1 5 10 15

Gly Ile Lys Glu Asp Thr Glu Glu His His Leu
20 25

<210> 2936
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<400> 2936

Ser His Gln Glu Ser Thr Arg Gly Arg Ser Arg Gly Arg Ser Gly Arg
1 5 10 15

Ser Gly Ser

<210> 2937
<211> 7
<212> PRT
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<400> 2937

Ser Leu Ser Leu Ser Pro Gly
1 5

<210> 2938
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<212> PRT
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<400> 2938

Ser Leu Thr Cys Leu Val Lys
1 5

<210> 2939
<211> 10
<212> PRT
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<400> 2939

Ser Pro Arg Ser Gly Asp Leu Ser Val Tyr
1 5 10

<210> 2940
<211> 7
<212> PRT
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<400> 2940

Ser Arg Glu Glu Met Thr Lys
1 5

<210> 2941
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<212> PRT
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<400> 2941

Ser Arg Trp Gln Glu Gly Asn
1 5

<210> 2942
<211> 16
<212> PRT
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<400> 2942

Ser Arg Tyr Cys Leu Ser Ser Arg Leu Arg Val Ser Ala Thr Phe Trp
1 5 10 15

<210> 2943
<211> 7
<212> PRT
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<400> 2943

Ser Val Met His Glu Gly Leu
1 5

<210> 2944
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<212> PRT
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<400> 2944

Thr Lys Asn Gln Val Ser Leu
1 5

<210> 2945
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<212> PRT
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<400> 2945

Thr Leu Pro Pro Ser Arg Glu
1 5

<210> 2946
<211> 7
<212> PRT
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<400> 2946

Val Glu Trp Gly Ser Asn Asp
1 5

<210> 2947
<211> 7
<212> PRT
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<400> 2947

Val Phe Ser Cys Ser Val Met
1 5

<210> 2948
<211> 7
<212> PRT
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<400> 2948

Val Met His Glu Gly Leu His
1 5

<210> 2949
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<400> 2949

Val Ser Leu Thr Cys Leu Val
1 5

<210> 2950
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<400> 2950

Val Tyr Phe Cys Ala Ser Ser Phe Ser Thr Cys Ser Ala Asn Tyr Gly
1 5 10 15

<210> 2951
<211> 7
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<400> 2951

Val Tyr Thr Leu Pro Pro Ser
1 5

<210> 2952
<211> 7
<212> PRT
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<400> 2952

Trp Gln Glu Gly Asn Val Phe
1 5

<210> 2953
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2953

Gly Ile Ala Gly Ala Pro Gly Phe Pro Gly Pro Arg Gly Pro Pro
1 5 10 15

<210> 2954
<211> 15
<212> PRT
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<400> 2954

Gly Ile Pro Gly Ala Lys Gly Ser Ala Gly Ala Pro Gly Ile Ala
1 5 10 15

<210> 2955

<211> 20
<212> PRT
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<400> 2955

Ala Arg Gly His Arg Pro Leu Asp Lys Lys Arg Glu Glu Ala Pro Ser
1 5 10 15

Leu Arg Pro Ala
20

<210> 2956
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2956

Ala Arg Gly His Arg Pro Leu Asp Lys Lys Arg Glu Glu Ala Pro Ser
1 5 10 15

Leu Arg Pro Ala
20

<210> 2957
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2957

Ala Arg Gly His Arg Pro Leu Asp Lys Lys Arg Glu Glu Ala Pro Ser
1 5 10 15

Leu Arg Pro Ala
20

<210> 2958
<211> 20
<212> PRT
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<400> 2958

Ala Arg Gly His Arg Pro Leu Asp Lys Lys Arg Glu Glu Ala Pro Ser
1 5 10 15

Leu Arg Pro Ala
20

<210> 2959
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2959

Ala Arg Gly His Arg Pro Leu Asp Lys Lys Arg Glu Glu Ala Pro Ser
1 5 10 15

Leu Arg Pro Ala
20

<210> 2960
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2960

Ala Arg Gly His Arg Pro Leu Asp Lys Lys Arg Glu Glu Ala Pro Ser
1 5 10 15

Leu Arg Pro Ala
20

<210> 2961
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2961

Ala Arg Gly His Arg Pro Leu Asp Lys Lys Arg Glu Glu Ala Pro Ser
1 5 10 15

Leu Arg Pro Ala
20

<210> 2962
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2962

Ala Arg Gly His Arg Pro Leu Asp Lys Lys Arg Glu Glu Ala Pro Ser
1 5 10 15

Leu Arg Pro Ala
20

<210> 2963
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2963

Ala Arg Gly His Arg Pro Leu Asp Lys Lys Arg Glu Glu Ala Pro Ser
1 5 10 15

Leu Arg Pro Ala
20

<210> 2964
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2964

Ala Arg Gly His Arg Pro Leu Asp Lys Lys Arg Glu Glu Ala Pro Ser
1 5 10 15

Leu Arg Pro Ala
20

<210> 2965
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2965

Ala Arg Gly His Arg Pro Leu Asp Lys Lys Arg Glu Glu Ala Pro Ser
1 5 10 15

Leu Arg Pro Ala
20

<210> 2966
<211> 20
<212> PRT
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<400> 2966

Ala Arg Gly His Arg Pro Leu Asp Lys Lys Arg Glu Glu Ala Pro Ser
1 5 10 15

Leu Arg Pro Ala
20

<210> 2967
<211> 20
<212> PRT
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<400> 2967

Ala Arg Gly His Arg Pro Leu Asp Lys Lys Arg Glu Glu Ala Pro Ser
1 5 10 15

Leu Arg Pro Ala
20

<210> 2968
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2968

Ala Arg Gly His Arg Pro Leu Asp Lys Lys Arg Glu Glu Ala Pro Ser
1 5 10 15

Leu Arg Pro Ala
20

<210> 2969
<211> 20
<212> PRT
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<400> 2969

Ala Arg Gly His Arg Pro Leu Asp Lys Lys Arg Glu Glu Ala Pro Ser
1 5 10 15

Leu Arg Pro Ala
20

<210> 2970
<211> 20
<212> PRT
<213> Homo sapiens

<400> 2970

Ala Arg Gly His Arg Pro Leu Asp Lys Lys Arg Glu Glu Ala Pro Ser
1 5 10 15

Leu Arg Pro Ala
20

<210> 2971
<211> 21
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2971

Ala Arg Gly His Arg Pro Leu Asp Lys Lys Arg Glu Glu Ala Pro Ser
1 5 10 15

Leu Arg Pro Ala Asp
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<210> 2972
<211> 38
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2972

Ala Arg Gly His Arg Pro Leu Asp Lys Lys Arg Glu Glu Ala Pro Ser
1   5   10   15

Leu Arg Pro Ala Gly Gly Gly His Ser Thr Lys Arg Gly His Ala Lys
            20   25   30

Ser Arg Pro Val Arg Gly
        35

<210> 2973
<211> 18
<212> PRT
<213> Homo sapiens

<400> 2973

Phe Phe Ser Ala Arg Gly His Arg Pro Leu Asp Lys Lys Arg Glu Glu
1   5   10   15

Ala Pro

<210> 2974
<211> 18
<212> PRT
<213> Homo sapiens

<400> 2974

Phe Phe Ser Ala Arg Gly His Arg Pro Leu Asp Lys Lys Arg Glu Glu
1   5   10   15

Ala Pro

<210> 2975
<211> 18
<212> PRT
<213> Homo sapiens

<400> 2975

Phe Phe Ser Ala Arg Gly His Arg Pro Leu Asp Lys Lys Arg Glu Glu
1 5 10 15

Ala Pro

<210> 2976
<211> 18
<212> PRT
<213> Homo sapiens

<400> 2976

Phe Phe Ser Ala Arg Gly His Arg Pro Leu Asp Lys Lys Arg Glu Glu
1 5 10 15

Ala Pro

<210> 2977
<211> 18
<212> PRT
<213> Homo sapiens

<400> 2977

Phe Phe Ser Ala Arg Gly His Arg Pro Leu Asp Lys Lys Arg Glu Glu
1 5 10 15

Ala Pro

<210> 2978
<211> 18
<212> PRT
<213> Homo sapiens

<400> 2978

Phe Phe Ser Ala Arg Gly His Arg Pro Leu Asp Lys Lys Arg Glu Glu
1 5 10 15

Ala Pro

<210> 2979
<211> 18
<212> PRT
<213> Homo sapiens

<400> 2979

Phe Phe Ser Ala Arg Gly His Arg Pro Leu Asp Lys Lys Arg Glu Glu
1 5 10 15

Ala Pro

<210> 2980
<211> 18
<212> PRT
<213> Homo sapiens

<400> 2980

Phe Phe Ser Ala Arg Gly His Arg Pro Leu Asp Lys Lys Arg Glu Glu
1 5 10 15

Ala Pro

<210> 2981
<211> 24
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2981

Gly Phe Phe Cys Ala Arg Gly His Arg Pro Leu Asp Lys Lys Arg Glu
1 5 10 15

Glu Ala Pro Cys Leu Arg Pro Ala
20

<210> 2982
<211> 18
<212> PRT
<213> Homo sapiens

<400> 2982

Gly Asn Val Ser Pro Gly Thr Arg Arg Glu Tyr His Thr Glu Lys Leu
1 5 10 15

Val Thr

<210> 2983
<211> 18
<212> PRT
<213> Homo sapiens

<400> 2983

Gly Asn Val Ser Pro Gly Thr Arg Arg Glu Tyr His Thr Glu Lys Leu
1 5 10 15

Val Thr

<210> 2984
<211> 18
<212> PRT
<213> Homo sapiens

<400> 2984

Gly Asn Val Ser Pro Gly Thr Arg Arg Glu Tyr His Thr Glu Lys Leu
1 5 10 15

Val Thr

<210> 2985
<211> 21
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2985

His Cys Thr Lys Arg Gly His Ala Lys Ser Arg Pro Val Arg Gly Ile
1 5 10 15

His Thr Cys Pro Leu
20

<210> 2986
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2986

His Ser Thr Lys Arg Gly His Ala Lys Ser Arg Pro Val Arg Gly
1 5 10 15

<210> 2987
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2987

His Ser Thr Lys Arg Gly His Ala Lys Ser Arg Pro Val Arg Gly
1 5 10 15

<210> 2988
<211> 15

<212> PRT
<213> Homo sapiens

<400> 2988

His Ser Thr Lys Arg Gly His Ala Lys Ser Arg Pro Val Arg Gly
1 5 10 15

<210> 2989
<211> 15
<212> PRT
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<400> 2989

His Ser Thr Lys Arg Gly His Ala Lys Ser Arg Pro Val Arg Gly
1 5 10 15

<210> 2990
<211> 15
<212> PRT
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<400> 2990

His Ser Thr Lys Arg Gly His Ala Lys Ser Arg Pro Val Arg Gly
1 5 10 15

<210> 2991
<211> 15
<212> PRT
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<400> 2991

His Ser Thr Lys Arg Gly His Ala Lys Ser Arg Pro Val Arg Gly
1 5 10 15

<210> 2992
<211> 15
<212> PRT
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<400> 2992

His Ser Thr Lys Arg Gly His Ala Lys Ser Arg Pro Val Arg Gly
1 5 10 15

<210> 2993
<211> 15
<212> PRT
<213> Homo sapiens

<400> 2993

His Ser Thr Lys Arg Gly His Ala Lys Ser Arg Pro Val Arg Gly
1 5 10 15

<210> 2994
<211> 36
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 2994

His Ser Thr Lys Arg Gly His Ala Lys Ser Arg Pro Val Arg Gly His
1 5 10 15

Gln Cys His Gln Glu Ser Thr Arg Gly Arg Ser Arg Gly Arg Cys Gly
20 25 30

Arg Ser Gly Ser
35

<210> 2995
<211> 18
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<400> 2995

Ile Ala Lys Asp Leu Leu Pro Ser Arg Asp Arg Gln His Leu Pro Leu
1 5 10 15

Ile Lys

<210> 2996
<211> 18
<212> PRT
<213> Homo sapiens

<400> 2996

Ile Ala Lys Asp Leu Leu Pro Ser Arg Asp Arg Gln His Leu Pro Leu
1 5 10 15

Ile Lys

<210> 2997
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<213> Homo sapiens

<400> 2997

Ile Ala Lys Asp Leu Leu Pro Ser Arg Asp Arg Gln His Leu Pro Leu
1 5 10 15

Ile Lys

<210> 2998
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<213> Homo sapiens

<400> 2998

Ile Ala Lys Asp Leu Leu Pro Ser Arg Asp Arg Gln His Leu Pro Leu
1 5 10 15

Ile Lys

<210> 2999
<211> 22
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<400> 2999

Gln Thr Leu Asp His Asn Thr Met Tyr Trp Tyr Lys Gln Asp Ser Lys
1 5 10 15

Lys Leu Leu Lys Ile Met
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<400> 3000

Arg Ala Arg Pro Ala Lys Ala Ala Ala Thr Gln Lys Lys Val Glu Arg
1 5 10 15

Lys Ala

<210> 3001
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<400> 3001

Arg Ala Arg Pro Ala Lys Ala Ala Ala Thr Gln Lys Lys Val Glu Arg
1 5 10 15

Lys Ala

<210> 3002
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<400> 3002

Arg Ala Arg Pro Ala Lys Ala Ala Ala Thr Gln Lys Lys Val Glu Arg
1 5 10 15

Lys Ala

<210> 3003
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<400> 3003

Arg Ala Arg Pro Ala Lys Ala Ala Ala Thr Gln Lys Lys Val Glu Arg
1 5 10 15

Lys Ala

<210> 3004
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<400> 3004

Arg Ala Arg Pro Ala Lys Ala Ala Ala Thr Gln Lys Lys Val Glu Arg
1 5 10 15

Lys Ala

<210> 3005
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<400> 3005

Arg Ala Arg Pro Ala Lys Ala Ala Ala Thr Gln Lys Lys Val Glu Arg
1 5 10 15

Lys Ala

<210> 3006

<211> 18
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<400> 3006

Ser Gly Ile Gly Thr Leu Asp Gly Phe Arg His Arg His Pro Asp Glu
1 5 10 15

Ala Ala

<210> 3007
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<400> 3007

Ser Gly Ile Gly Thr Leu Asp Gly Phe Arg His Arg His Pro Asp Glu
1 5 10 15

Ala Ala

<210> 3008
<211> 18
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<400> 3008

Ser Arg Ala Leu Ala Arg Glu Val Asp Leu Lys Asp Tyr Glu Asp Gln
1 5 10 15

Gln Lys

<210> 3009
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<212> PRT
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<400> 3009

Ser Arg Ala Leu Ala Arg Glu Val Asp Leu Lys Asp Tyr Glu Asp Gln
1 5 10 15

Gln Lys

<210> 3010
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<212> PRT
<213> Homo sapiens

<400> 3010

Ser Arg Ala Leu Ala Arg Glu Val Asp Leu Lys Asp Tyr Glu Asp Gln
1 5 10 15

Gln Lys

<210> 3011
<211> 15
<212> PRT
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<400> 3011

Gly Asn Pro Gly Thr Asp Gly Ile Pro Gly Ala Lys Gly Ser Ala
1 5 10 15

<210> 3012
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<212> PRT
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<400> 3012

Gly Pro Ala Gly Ala Ser Gly Asn Pro Gly Thr Asp Gly Ile Pro
1 5 10 15

<210> 3013
<211> 15
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<400> 3013

Gly Pro Arg Gly Glu Pro Gly Thr Pro Gly Ser Pro Gly Pro Ala
1 5 10 15

<210> 3014
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3014

Gly Thr Pro Gly Ser Pro Gly Pro Ala Gly Ala Ser Gly Asn Pro
1 5 10 15

<210> 3015
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<213> Homo sapiens

<400> 3015

Ala Gly Glu Lys Val Thr Met

1 5

<210> 3016
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<400> 3016

Ala His Ile Trp Trp Asn Asp
1 5

<210> 3017
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Ala Arg Met Arg Asp Gly Ala
1 5

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<400> 3018

Ala Ser Thr Arg Glu Ser Gly
1 5

<210> 3019
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<400> 3019

Ala Val Tyr Phe Cys His Gln
1 5

<210> 3020
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<400> 3020

Ala Trp Phe Ala Tyr Trp Gly
1 5

<210> 3021
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<400> 3021

Ala Tyr Trp Gly Gln Gly Thr
1 5

<210> 3022
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<400> 3022

Cys Ala Arg Met Arg Asp Gly
1 5

<210> 3023
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<400> 3023

Cys His Gln Tyr Leu Ser Ser
1 5

<210> 3024
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<400> 3024

Cys Ser Phe Ser Gly Phe Ser
1 5

<210> 3025
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<400> 3025

Asp Gly Ala Trp Phe Ala Tyr
1 5

<210> 3026
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<400> 3026

Asp His Lys Asn Tyr Leu Ala
1 5

<210> 3027
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<400> 3027

Asp Leu Ala Val Tyr Phe Cys
1 5

<210> 3028
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<400> 3028

Glu Asp Leu Ala Val Tyr Phe
1 5

<210> 3029
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<400> 3029

Glu Ser Gly Val Pro Asp Arg
1 5

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<400> 3030

Glu Trp Leu Ala His Ile Trp
1 5

<210> 3031
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Phe Ala Tyr Trp Gly Gln Gly
1 5

<210> 3032
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<400> 3032

Phe Cys His Gln Tyr Leu Ser
1 5

<210> 3033
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<400> 3033

Phe Ser Gly Phe Ser Leu Thr
1 5

<210> 3034
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<400> 3034

Phe Ser Leu Thr Thr Tyr Gly
1 5

<210> 3035
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<400> 3035

Phe Tyr Asn Thr Val Leu Lys
1 5

<210> 3036
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<400> 3036

Gly Ala Trp Phe Ala Tyr Trp
1 5

<210> 3037
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<400> 3037

Gly Phe Ser Leu Thr Thr Tyr
1 5

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<400> 3038

Gly Ile Gly Val Gly Trp Ile
1 5

<210> 3039
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<400> 3039

Gly Lys Gly Leu Glu Trp Leu
1 5

<210> 3040
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<400> 3040

Gly Leu Glu Trp Leu Ala His
1 5

<210> 3041
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<213> Bos taurus

<400> 3041

Gly Pro Ala Gly Pro Ala Gly Thr Ala Gly Ala Arg Gly Ala Pro
1 5 10 15

<210> 3042
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<400> 3042

Gly Gln Ser Pro Lys Leu Leu
1 5

<210> 3043
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<212> PRT
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<400> 3043

Gly Ser Gly Ser Gly Thr Asp
1 5

<210> 3044
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<400> 3044

Gly Ser Gly Thr Asp Phe Thr
1 5

<210> 3045
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<400> 3045

Gly Val Gly Trp Ile Arg Gln
1 5

<210> 3046
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<400> 3046

Gly Val Pro Asp Arg Phe Thr
1 5

<210> 3047
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<400> 3047

Gly Trp Ile Arg Gln Arg Ser
1 5

<210> 3048
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<400> 3048

His Ile Trp Trp Asn Asp Asn
1 5

<210> 3049
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<400> 3049

His Gln Tyr Leu Ser Ser Phe
1 5

<210> 3050

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<400> 3050

Ile Gly Val Gly Trp Ile Arg
1 5

<210> 3051
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<400> 3051

Ile Arg Gln Arg Ser Gly Lys
1 5

<210> 3052
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<400> 3052

Ile Trp Trp Asn Asp Asn Lys
1 5

<210> 3053
<211> 7
<212> PRT
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<400> 3053

Lys Gly Leu Glu Trp Leu Ala
1 5

<210> 3054
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<212> PRT
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<400> 3054

Lys Leu Leu Ile Tyr Trp Ala
1 5

<210> 3055
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<400> 3055

Lys Asn Tyr Leu Ala Trp Tyr
1 5

<210> 3056
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<400> 3056

Lys Val Thr Met Thr Cys Lys
1 5

<210> 3057
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<400> 3057

Leu Ala His Ile Trp Trp Asn
1 5

<210> 3058
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Leu Ala Val Tyr Phe Cys His
1 5

<210> 3059
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<400> 3059

Leu Glu Trp Leu Ala His Ile
1 5

<210> 3060
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Leu Ile Tyr Trp Ala Ser Thr
1 5

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Leu Leu Ile Tyr Trp Ala Ser
1 5

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Leu Thr Cys Ser Phe Ser Gly
1 5

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Leu Tyr Ser Ser Asp His Lys
1 5

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Met Arg Asp Gly Ala Trp Phe
1 5

<210> 3065
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Asn Tyr Leu Ala Trp Tyr Gln
1 5

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Pro Gly Gln Ser Pro Lys Leu
1 5

<210> 3067
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Pro Lys Leu Leu Ile Tyr Trp
1 5

<210> 3068
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Gln Ser Pro Lys Leu Leu Ile
1 5

<210> 3069
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Gln Ser Val Leu Tyr Ser Ser
1 5

<210> 3070
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Gln Thr Glu Asp Leu Ala Val
1 5

<210> 3071
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Gln Tyr Leu Ser Ser Phe Thr
1 5

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Arg Asp Gly Ala Trp Phe Ala
1 5

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Arg Glu Ser Gly Val Pro Asp
1 5

<210> 3074
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Arg Met Arg Asp Gly Ala Trp
1 5

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Ser Ala Gly Glu Lys Val Thr
1 5

<210> 3076
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<400> 3076

Ser Asp His Lys Asn Tyr Leu
1 5

<210> 3077
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<400> 3077

Ser Phe Ser Gly Phe Ser Leu
1 5

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Ser Gly Phe Ser Leu Thr Thr

1 5

<210> 3079
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Ser Gly Ser Gly Thr Asp Phe
1 5

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Ser Gly Val Pro Asp Arg Phe
1 5

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Ser Leu Thr Thr Tyr Gly Ile
1 5

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Ser Pro Lys Leu Leu Ile Tyr
1 5

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Ser Gln Ser Val Leu Tyr Ser
1 5

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Ser Ser Gln Ser Val Leu Tyr
1 5

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Ser Thr Arg Glu Ser Gly Val
1 5

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<400> 3086

Ser Val Leu Tyr Ser Ser Asp
1 5

<210> 3087
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<400> 3087

Thr Cys Ser Phe Ser Gly Phe
1 5

<210> 3088
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<400> 3088

Thr Glu Asp Leu Ala Val Tyr
1 5

<210> 3089
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<400> 3089

Thr Gly Ser Gly Ser Gly Thr
1 5

<210> 3090
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<400> 3090

Thr Met Thr Cys Lys Ser Ser
1 5

<210> 3091
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<400> 3091

Thr Arg Glu Ser Gly Val Pro
1 5

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Thr Thr Tyr Gly Ile Gly Val
1 5

<210> 3093
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<400> 3093

Thr Tyr Gly Ile Gly Val Gly
1 5

<210> 3094
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Thr Tyr Tyr Cys Ala Arg Met
1 5

<210> 3095
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<400> 3095

Val Gly Trp Ile Arg Gln Arg
1 5

<210> 3096
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<400> 3096

Val Leu Tyr Ser Ser Asp His
1 5

<210> 3097
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<400> 3097

Val Pro Asp Arg Phe Thr Gly
1 5

<210> 3098
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Val Thr Met Thr Cys Lys Ser
1 5

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Val Tyr Phe Cys His Gln Tyr
1 5

<210> 3100
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Trp Ala Ser Thr Arg Glu Ser
1 5

<210> 3101
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<400> 3101

Trp Phe Ala Tyr Trp Gly Gln
1 5

<210> 3102
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Trp Ile Arg Gln Arg Ser Gly
1 5

<210> 3103
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<400> 3103

Trp Leu Ala His Ile Trp Trp
1 5

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Trp Asn Asp Asn Lys Phe Tyr
1 5

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Trp Trp Asn Asp Asn Lys Phe
1 5

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Tyr Cys Ala Arg Met Arg Asp
1 5

<210> 3107
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<400> 3107

Tyr Phe Cys His Gln Tyr Leu
1 5

<210> 3108
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<400> 3108

Tyr Gly Ile Gly Val Gly Trp
1 5

<210> 3109
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<400> 3109

Tyr Leu Ala Trp Tyr Gln Gln
1 5

<210> 3110
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<400> 3110

Tyr Leu Ser Ser Phe Thr Phe
1 5

<210> 3111
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<400> 3111

Tyr Ser Ser Asp His Lys Asn
1 5

<210> 3112
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<400> 3112

Tyr Trp Ala Ser Thr Arg Glu
1 5

<210> 3113

<211> 7
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<400> 3113

Tyr Tyr Cys Ala Arg Met Arg
1 5

<210> 3114
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<213> Mycobacterium tuberculosis

<400> 3114

Ala Ile Leu Thr Gly Gly Gln Val Ile Ser Glu Glu Gly Val Gly Leu
1 5 10 15

<210> 3115
<211> 16
<212> PRT
<213> Mycobacterium tuberculosis

<400> 3115

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

<210> 3116
<211> 16
<212> PRT
<213> Mycobacterium tuberculosis

<400> 3116

Asp Val Glu Gly Glu Ala Leu Ser Thr Leu Val Val Asn Lys Ile Arg
1 5 10 15

<210> 3117
<211> 15
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<213> Mycobacterium tuberculosis

<400> 3117

Glu Glu Gly Val Gly Leu Thr Leu Glu Asn Ala Asp Leu Ser Leu
1 5 10 15

<210> 3118
<211> 11
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<213> Mycobacterium tuberculosis

<400> 3118

Val Val Asn Lys Ile Arg Gly Thr Phe Lys Ser
1 5 10

<210> 3119
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<212> PRT
<213> Mycobacterium tuberculosis

<400> 3119

Val Val Asn Lys Ile Arg Gly Thr Phe Lys Ser Val Ala Val Lys Ala
1 5 10 15

<210> 3120
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Gln Asp Phe Thr Asn Arg Ile Asn Lys Leu Lys Asn Ser
1 5 10

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<211> 8
<212> PRT
<213> Streptococcus pyogenes

<400> 3121

Leu Thr Ser Arg Pro Ala His Gly
1 5

<210> 3122
<211> 12
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<213> Mus musculus

<400> 3122

Leu Tyr Phe Cys Ala Ala Arg Ser Asn Tyr Gln Leu
1 5 10

<210> 3123
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<213> Rattus norvegicus

<400> 3123

Ala Leu Ser Thr Leu Val Leu Asn Arg Leu Lys Val Gly Leu Gln
1 5 10 15

<210> 3124
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<400> 3124

Ala Tyr Val Leu Leu Ser Glu Lys Lys Ile Ser Ser Ile Gln Ser
1 5 10 15

<210> 3125
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<400> 3125

Gly Glu Ala Leu Ser Thr Leu Val Leu Asn Arg Leu Lys Val Gly
1 5 10 15

<210> 3126
<211> 15
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<400> 3126

Gly Glu Ala Leu Ser Thr Leu Val Val Asn Lys Ile Arg Gly Thr
1 5 10 15

<210> 3127
<211> 15
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<400> 3127

Lys Cys Glu Phe Gln Asp Ala Tyr Val Leu Leu Ser Glu Lys Lys
1 5 10 15

<210> 3128
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<400> 3128

Val Ala Ser Leu Leu Thr Thr Ala Glu Val Val Val Thr Glu Ile
1 5 10 15

<210> 3129
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<212> PRT
<213> Rattus norvegicus

<400> 3129

Lys Glu Arg Tyr Ser Thr Leu Tyr Ile Ser Asn Ala Gln Val Glu
1 5 10 15

<210> 3130
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<213> Homo sapiens

<400> 3130

Ala Val Cys Arg Thr Ser Met Cys Ser Ile Gln Ser Ala Pro Pro
1 5 10 15

<210> 3131
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<400> 3131

Gly Glu Pro Gly Ile Ala Gly Phe Lys Gly Asp Gln Gly Pro Lys
1 5 10 15

<210> 3132
<211> 15
<212> PRT
<213> Rattus norvegicus

<400> 3132

Gly Glu Pro Gly Ile Ala Gly Phe Lys Gly Glu Gln Gly Pro Lys
1 5 10 15

<210> 3133
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<212> PRT
<213> Rattus norvegicus

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Ile Ala Gly Phe Lys Gly Glu Gln
1 5

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<213> Bos taurus

<400> 3134

Gly Glu Pro Gly Ile Ala Gly Phe Lys Gly Glu Gln Gly Pro Lys
1 5 10 15

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<212> PRT
<213> Bos taurus

<400> 3135

Gly Glu Pro Gly Ile Ala Gly Phe Lys Gly Glu Gln Gly Pro Lys
1 5 10 15

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Ala Gly Ala Ala Arg Asp Ala Leu Gln Gly Phe Lys Ile Thr Gln Asn
1 5 10 15

Asn Ala Met Lys Ile Ser Phe Ala Lys Lys
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<400> 3137

Glu Pro Ala Val Tyr Phe Lys Glu Gln Phe Leu Asp Gly Asp Gly Trp
1 5 10 15

Thr Ser Arg Trp Ile Glu Ser Lys
20

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Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg
1 5 10 15

Gly Arg Gly Gly Pro Arg Arg
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<213> Homo sapiens

<400> 3139

Lys Ala Leu Ser Val Glu Thr Glu Lys Leu Leu Lys Tyr Leu Glu Ala
1 5 10 15

Val

<210> 3140
<211> 24
<212> PRT

<213> Homo sapiens

<400> 3140

Lys Met Thr Leu Lys Asn Arg Glu Pro Val Gln Leu Glu Thr Leu Ser
1 5 10 15

Ile Arg Gly Asn Arg Ile Arg Tyr
20

<210> 3141
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3141

Lys Pro Lys Ala Ala Lys Pro Lys Lys Ala Ala Ala Lys Lys Lys
1 5 10 15

<210> 3142
<211> 11
<212> PRT
<213> Homo sapiens

<400> 3142

Met Ala Val Pro Glu Thr Arg Pro Asn His Thr
1 5 10

<210> 3143
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3143

Met Lys Leu Val Arg Phe Leu Met Lys Leu Ser His Glu Thr Val Thr
1 5 10 15

Ile Glu Leu Lys
20

<210> 3144
<211> 17
<212> PRT
<213> Enterovirus A

<400> 3144

Met Val Thr Ser Thr Ile Thr Glu Lys Leu Leu Lys Asn Leu Val Lys
1 5 10 15

Ile

<210> 3145
<211> 21
<212> PRT
<213> Mus musculus

<400> 3145

Arg Ile His Met Val Tyr Ser Lys Arg Ser Gly Lys Pro Arg Gly Tyr
1 5 10 15

Ala Phe Ile Glu Tyr
20

<210> 3146
<211> 24
<212> PRT
<213> Homo sapiens

<400> 3146

Ser Gln Phe Gly Gln Ile Leu Asp Ile Leu Val Ser Arg Ser Leu Lys
1 5 10 15

Met Arg Gly Gln Ala Phe Val Ile
20

<210> 3147
<211> 22
<212> PRT
<213> Homo sapiens

<400> 3147

Thr Lys Tyr Lys Gln Arg Asn Gly Trp Ser His Lys Asp Leu Leu Arg
1 5 10 15

Leu Ser His Leu Lys Pro
20

<210> 3148
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3148

Thr Leu His Lys Ala Phe Lys Gly Ser Ile Phe Val Val Phe Asp Ser
1 5 10 15

Ile Glu Ser Ala
20

<210> 3149
<211> 37

<212> PRT
<213> Homo sapiens

<400> 3149

Val Glu Pro Lys Val Lys Ser Lys Lys Arg Glu Ala Val Ala Gly Arg
1 5 10 15

Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg
20 25 30

Gly Gly Pro Arg Arg
35

<210> 3150
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3150

Ala Ala Arg Gly Arg Gly Arg Gly Met Gly Arg Gly Asn Ile Phe
1 5 10 15

<210> 3151
<211> 22
<212> PRT
<213> Homo sapiens

<400> 3151

Thr Lys Tyr Lys Gln Arg Asn Gly Trp Ser His Lys Asp Leu Leu Arg
1 5 10 15

Leu Ser His Leu Lys Pro
20

<210> 3152
<211> 22
<212> PRT
<213> Homo sapiens

<400> 3152

Thr Lys Tyr Lys Gln Arg Asn Gly Trp Ser His Lys Asp Leu Leu Arg
1 5 10 15

Leu Ser His Leu Lys Pro
20

<210> 3153
<211> 25
<212> PRT
<213> Homo sapiens

<400> 3153

Val Ala Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg
1 5 10 15

Gly Arg Gly Arg Gly Gly Pro Arg Arg
20 25

<210> 3154
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3154

Arg Lys Gly His Phe Leu Leu Ser Ser Lys Ser Gly Phe Trp Thr Ile
1 5 10 15

Trp Leu

<210> 3155
<211> 22
<212> PRT
<213> Mus musculus

<400> 3155

Ala Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly
1 5 10 15

Arg Gly Arg Gly Ser Leu
20

<210> 3156
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3156

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

<210> 3157
<211> 15
<212> PRT
<213> Human Endogenous Retrovirus

<400> 3157

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

<210> 3158

<211> 16
<212> PRT
<213> Homo sapiens

<400> 3158

Gly Leu Lys Lys Met Leu Arg Thr Cys Ala Val His Ile Thr Leu Asp
1 5 10 15

<210> 3159
<211> 49
<212> PRT
<213> Mus musculus

<400> 3159

Pro Leu Phe Pro Ala Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly
1 5 10 15

Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly
20 25 30

Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Ser Leu Ile Tyr
35 40 45

Ile

<210> 3160
<211> 9
<212> PRT
<213> Mycobacterium bovis

<400> 3160

Lys Pro Leu Leu Ile Ile Ala Glu Asp
1 5

<210> 3161
<211> 10
<212> PRT
<213> Human adenovirus

<400> 3161

Phe Trp Arg Phe Leu Trp Gly Ser Ser Gln
1 5 10

<210> 3162
<211> 20
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3162

Met Ser Lys Thr Glu Trp Asn Ala Ser Gln Leu Pro Arg Leu Gly Gly
1 5 10 15

Lys Glu Asp Arg
20

<210> 3163
<211> 20
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3163

Met Ser Lys Thr Glu Trp Asn Ala Ser Gln Ser Arg Phe Gly Trp Phe
1 5 10 15

Glu Asn Lys Glu
20

<210> 3164
<211> 11
<212> PRT
<213> Influenza A virus

<400> 3164

Thr Leu Gln Arg Phe Ala Trp Gly Ser Ser Asn
1 5 10

<210> 3165
<211> 50
<212> PRT
<213> Homo sapiens

<400> 3165

Gly Tyr Gly Lys Ile Asn Lys Lys Arg Ile Ala Leu Thr Asp Asn Ala
1 5 10 15

Leu Ile Ala Arg Ser Leu Gly Lys Tyr Gly Ile Ile Cys Met Glu Asp
20 25 30

Leu Ile His Glu Ile Tyr Thr Val Gly Lys Arg Phe Lys Glu Ala Asn
35 40 45

Asn Phe
50

<210> 3166

<211> 19
<212> PRT
<213> Homo sapiens

<400> 3166

Arg Met Ala Arg Met Ala Arg Lys Ala Gly Asn Phe Tyr Val Pro Ala
1 5 10 15

Glu Pro Lys

<210> 3167
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3167

Ala Ala Val Gly Thr Ser Ala Ala Pro Val Pro Ser Asp Asn His
1 5 10 15

<210> 3168
<211> 15
<212> PRT
<213> Proteus mirabilis

<400> 3168

Phe Ala Glu Ser Arg Ile Arg Arg Glu Thr Ile Ala Ala Glu Asp
1 5 10 15

<210> 3169
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3169

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

<210> 3170
<211> 15
<212> PRT
<213> Proteus mirabilis

<400> 3170

Leu Gly Ser Ser Glu Ser Arg Arg Ala Leu Gln Asp Ser Gln Arg
1 5 10 15

<210> 3171
<211> 5
<212> PRT
<213> Homo sapiens

<400> 3171

Leu Arg Arg Glu Ile
1 5

<210> 3172
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3172

Ser Gln Lys Asp Leu Leu Glu Gln Arg Arg Ala Ala Val Asp Thr Tyr
1 5 10 15

<210> 3173
<211> 21
<212> PRT
<213> Bos taurus

<400> 3173

Ala Arg Thr Lys Gln Thr Ala Arg Lys Ser Thr Gly Gly Lys Ala Pro
1 5 10 15

Arg Lys Gln Leu Ala
20

<210> 3174
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3174

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

<210> 3175
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3175

Phe Asn Gly Glu Lys Ile Asn Tyr Thr Glu Gly Arg Ala Val Leu
1 5 10 15

<210> 3176
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3176

Lys Ile Phe Val Gln Gly Ile Ile Trp Asp Ile Asn Ser Phe Asp
1 5 10 15

<210> 3177
<211> 21
<212> PRT
<213> Bos taurus

<400> 3177

Leu Ala Gly Asn Ala Ala Arg Asp Asn Lys Lys Thr Arg Ile Ile Pro
1 5 10 15

Arg His Leu Gln Leu
20

<210> 3178
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3178

Leu Gly Lys Gln Leu Ala Lys Lys Ile Glu Pro Glu Leu Asp Gly
1 5 10 15

<210> 3179
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3179

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

<210> 3180
<211> 16
<212> PRT
<213> Bos taurus

<400> 3180

Pro Ala Thr Gly Gly Val Lys Lys Pro His Arg Tyr Arg Pro Gly Thr
1 5 10 15

<210> 3181
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3181

Val Glu Ile Arg Ala Glu Gly Asn Ser Arg Phe Thr Tyr
1 5 10

<210> 3182
<211> 10

<212> PRT
<213> Homo sapiens

<400> 3182

Ala Ser Ala Ala Arg Leu Thr Met Met Trp
1 5 10

<210> 3183
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3183

Leu Phe Lys Pro Pro Lys Tyr His Pro Asp Val Pro Tyr Val Lys Arg
1 5 10 15

<210> 3184
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3184

Leu Arg Lys Phe Lys Asn Ile Ser Tyr Phe Pro Gly Lys Leu Arg
1 5 10 15

<210> 3185
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3185

Ser Lys Leu Ile Lys Ile Phe Gln Asp His Pro Leu Gln Lys Thr Tyr
1 5 10 15

Asn

<210> 3186
<211> 15
<212> PRT
<213> Proteus mirabilis

<400> 3186

Ala Ser Arg Glu Thr Lys Glu Leu Arg Gln Glu Glu Arg Gln Pro
1 5 10 15

<210> 3187
<211> 15
<212> PRT
<213> Unknown

<220>

<223> epitope involved in rheumatoid arthritis

<400> 3187

Asn Gly Ser Ser Glu Ser Arg Arg Ala Leu Gln Asp Ser Gln Arg
1 5 10 15

<210> 3188
<211> 16
<212> PRT
<213> Rattus norvegicus

<400> 3188

Tyr Tyr Val Phe Phe Glu Glu Gln Glu Asp Glu Ile Ile Gly Phe Gly
1 5 10 15

<210> 3189
<211> 15
<212> PRT
<213> Human herpesvirus

<400> 3189

Gln Lys Arg Ala Ala Gln Arg Ala Ala Gly Pro Ser Val Ala Ser
1 5 10 15

<210> 3190
<211> 15
<212> PRT
<213> Lactococcus lactis

<400> 3190

Gln Lys Arg Ala Ala Tyr Asp Gln Tyr Gly Glu Ala Gly Ala Asn
1 5 10 15

<210> 3191
<211> 15
<212> PRT
<213> Brucella ovis

<400> 3191

Gln Lys Arg Ala Ala Tyr Asp Arg Phe Gly His Ala Ala Phe Glu
1 5 10 15

<210> 3192
<211> 19
<212> PRT
<213> Homo sapiens

<400> 3192

Leu Pro Asn Phe Ser Ser Leu Asn Leu Arg Glu Thr Asn Leu Asp Ser
1 5 10 15

Leu Pro Leu

<210> 3193
<211> 19
<212> PRT
<213> Homo sapiens

<400> 3193

Leu Pro Asn Phe Ser Ser Leu Asn Leu Arg Glu Thr Asn Leu Asp Ser
1 5 10 15

Leu Pro Leu

<210> 3194
<211> 19
<212> PRT
<213> Homo sapiens

<400> 3194

Ser Ser Arg Ser Tyr Val Thr Thr Ser Thr Arg Thr Tyr Ser Leu Gly
1 5 10 15

Ser Ala Leu

<210> 3195
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3195

Ala Leu Pro Pro Pro Tyr Met
1 5

<210> 3196
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3196

Glu Ser Met Pro Ala Leu Ser
1 5

<210> 3197

<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3197

Gly Thr Asn Thr Ala Gln Lys
1 5

<210> 3198
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3198

Ile Pro Asn Ser Thr His Thr
1 5

<210> 3199
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3199

Lys Trp Ser Phe Thr Pro Pro
1 5

<210> 3200
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3200

Leu His Ser Asp Ala Arg Asp
1 5

<210> 3201
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3201

Leu Asn Thr Thr Leu Lys Val
1 5

<210> 3202
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3202

Leu Pro Tyr Lys Leu Thr Gln
1 5

<210> 3203
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3203

Met Val Pro Glu Leu Thr Glu
1 5

<210> 3204
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3204

Pro Gly Pro Ser Thr Thr Ser
1 5

<210> 3205
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3205

Ala Ala Ala Gly Tyr Asp Val Glu Lys Asn Asn Ser Arg Ile Lys Leu
1 5 10 15

<210> 3206
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3206

Ala Ala Lys Pro Lys Thr Ala Lys Pro Lys Ala Ala Lys Pro Lys Lys
1 5 10 15

<210> 3207
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3207

Ala Gly Ala Ala Lys Arg Lys Ala Ser Gly Pro Pro Val Ser Glu Leu
1 5 10 15

<210> 3208
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3208

Ala Lys Lys Ala Gly Ala Ala Lys Ala Lys Lys Pro Ala Gly Ala Ala
1 5 10 15

<210> 3209
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3209

Ala Pro Lys Ser Pro Ala Lys Ala Lys Ala Val Lys Pro Lys Ala Ala
1 5 10 15

<210> 3210
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3210

Ala Thr Pro Lys Lys Ser Ala Lys Lys Thr Pro Lys Lys Ala Lys Lys
1 5 10 15

<210> 3211
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3211

Glu Lys Thr Pro Val Lys Lys Lys Ala Arg Lys Ser Ala Gly Ala Ala
1 5 10 15

<210> 3212

<211> 16
<212> PRT
<213> Homo sapiens

<400> 3212

Ile Lys Leu Gly Leu Lys Ser Leu Val Ser Lys Gly Thr Leu Val Gln
1 5 10 15

<210> 3213
<211> 15
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3213

Ile Trp Tyr Ile Asn Cys Phe Ala Cys Glu Thr His Ala Met Leu
1 5 10 15

<210> 3214
<211> 15
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3214

Ile Trp Tyr Ile Asn Cys Phe Val Cys Glu Thr His Ala Met Leu
1 5 10 15

<210> 3215
<211> 15
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3215

Ile Trp Tyr Ile Ser Cys Phe Gly Cys Glu Thr His Ala Met Leu
1 5 10 15

<210> 3216
<211> 15
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3216

Ile Trp Tyr Ile Thr Cys Phe Gly Cys Glu Thr His Ala Met Leu

1 5 10 15

<210> 3217
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3217

Lys Ala Lys Lys Pro Ala Ala Ala Ala Gly Ala Lys Lys Ala Lys Ser
1 5 10 15

<210> 3218
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3218

Lys Glu Ile Lys Lys Val Ala Thr Pro Lys Lys Ala Ser Lys Pro Lys
1 5 10 15

Lys

<210> 3219
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3219

Lys Leu Asn Lys Lys Ala Ala Ser Gly Glu Ala Lys Pro Lys Ala Lys
1 5 10 15

<210> 3220
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3220

Lys Ser Pro Lys Lys Ala Lys Ala Ala Lys Pro Lys Lys Ala Pro Lys
1 5 10 15

<210> 3221
<211> 15
<212> PRT
<213> Gallus gallus

<400> 3221

Lys Ser Arg Lys Ala Ser Lys Ala Lys Lys Val Lys Arg Ser Lys
1 5 10 15

<210> 3222

<211> 16
<212> PRT
<213> Homo sapiens

<400> 3222

Leu Val Gln Thr Lys Gly Thr Gly Ala Ser Gly Ser Phe Lys Leu Asn
1 5 10 15

<210> 3223
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3223

Pro Ala Gly Ala Ala Lys Lys Pro Lys Lys Ala Thr Gly Ala Ala Thr
1 5 10 15

<210> 3224
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3224

Arg Ser Gly Val Ser Leu Ala Ala Leu Lys Lys Ala Leu Ala Ala Ala
1 5 10 15

<210> 3225
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3225

Ser Glu Thr Ala Pro Ala Ala Pro Ala Ala Pro Ala Pro Ala Glu Lys
1 5 10 15

<210> 3226
<211> 16
<212> PRT
<213> Gallus gallus

<400> 3226

Ser Lys Pro Arg Ala Lys Ser Gly Ala Arg Lys Ser Pro Lys Lys Lys
1 5 10 15

<210> 3227
<211> 31
<212> PRT
<213> Gallus gallus

<400> 3227

Thr Glu Ser Leu Val Leu Ser Pro Ala Pro Ala Lys Pro Lys Arg Val
1 5 10 15

Lys Ala Ser Arg Arg Ser Ala Ser His Pro Thr Tyr Ser Glu Met
20 25 30

<210> 3228
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3228

Val Ser Glu Leu Ile Thr Lys Ala Val Ala Ala Ser Lys Glu Arg Ser
1 5 10 15

<210> 3229
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3229

Cys Ser Ala Gly Trp Leu Ala Asp Arg Ser Val Arg Tyr Pro Ile Ser
1 5 10 15

Lys Ala

<210> 3230
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3230

Ile Pro Cys Tyr Phe Ile Asp Pro Met His Pro Val Thr Thr Ala Pro
1 5 10 15

<210> 3231
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3231

Lys Glu Lys Glu Val Val Leu Leu Val Ala Thr Glu Gly Arg Val Arg
1 5 10 15

<210> 3232
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3232

Leu Ala Asp Arg Ser Val Arg Tyr Pro Ile Ser Lys Ala Arg Pro Asn
1 5 10 15

Cys Gly

<210> 3233
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3233

Leu Gln Lys Arg Ser Ser Arg His Pro Arg Arg Ser Arg Pro Ser Thr
1 5 10 15

<210> 3234
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3234

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

Val Arg

<210> 3235
<211> 15
<212> PRT
<213> Yersinia enterocolitica

<400> 3235

Gln Lys Gln Leu Gly Trp Gln Ala Gly Met Asp Glu Ala Arg Thr
1 5 10 15

<210> 3236
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3236

Gln Pro Ser Pro Leu Arg Val Leu Leu Gly Thr Ser Leu Thr Ile Pro
1 5 10 15

<210> 3237
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3237

Arg Val Leu Leu Gly Thr Ser Leu Thr Ile Pro Cys Tyr Phe Ile Asp
1 5 10 15

<210> 3238
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3238

Arg Val Asn Ser Ala Tyr Gln Asp Lys Val Ser Leu Pro Asn Tyr Pro
1 5 10 15

<210> 3239
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3239

Thr Thr Gly His Val Tyr Leu Ala Trp Gln Ala Gly Met Asp Met Cys
1 5 10 15

Ser Ala

<210> 3240
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3240

Val Ala Thr Glu Gly Arg Val Arg Val Asn Ser Ala Tyr Gln Asp Lys
1 5 10 15

Val

<210> 3241
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3241

Ala Ser Ser Leu Leu Ala Ser Ser Pro
1 5

<210> 3242
<211> 9
<212> PRT
<213> Unknown

<220>

<223> epitope involved in rheumatoid arthritis

<400> 3242

Ile Pro Phe Pro Thr Leu Phe Ala Pro
1 5

<210> 3243
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3243

Pro His Glu Ser Asp Ala Thr Val Arg
1 5

<210> 3244
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3244

Pro His Asn Arg Gln Glu Ser Pro Ala
1 5

<210> 3245
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3245

Pro Pro Leu Lys Pro Val Ile Asp Glu
1 5

<210> 3246
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3246

Pro Ser Pro Ser Leu Ser His Pro Leu
1 5

<210> 3247
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3247

Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly Ala Val
1 5 10 15

<210> 3248
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3248

Ser Gly Leu Gln Ala Glu Asp Glu Ala Asp Tyr Tyr Cys Ser Ser Tyr
1 5 10 15

<210> 3249
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3249

Thr Gly Thr Ser Ser Asp Val Gly Gly Tyr Asn Tyr Val Ser Trp Tyr
1 5 10 15

<210> 3250
<211> 8
<212> PRT
<213> Homo sapiens

<400> 3250

Glu Val Phe Ile Ser Ala Pro Arg
1 5

<210> 3251
<211> 21
<212> PRT
<213> Human T-lymphotropic virus

<400> 3251

Pro Pro Pro Pro Ser Ser Pro Thr His Asp Pro Pro Asp Ser Asp Pro
1 5 10 15

Gln Ile Pro Pro Pro
20

<210> 3252
<211> 8
<212> PRT

<213> Homo sapiens

<400> 3252

Pro Gln Ile Val Pro Glu Pro Met
1 5

<210> 3253
<211> 21
<212> PRT
<213> Homo sapiens

<400> 3253

Pro Thr Arg Ala Pro Ser Gly Pro Arg Pro Pro Ser Arg Ser Gln Ala
1 5 10 15

Gln Thr Pro Pro Arg
20

<210> 3254
<211> 12
<212> PRT
<213> Homo sapiens

<400> 3254

Ala Thr Glu Gly Arg Val Arg Val Asn Ser Ala Tyr
1 5 10

<210> 3255
<211> 6
<212> PRT
<213> Homo sapiens

<400> 3255

Leu Thr Ser Arg Pro Ala
1 5

<210> 3256
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3256

Val Val Leu Leu Val Ala Thr Glu Gly Arg Val Arg Val Asn Ser Ala
1 5 10 15

Tyr Gln Asp Lys
20

<210> 3257
<211> 20
<212> PRT

<213> Homo sapiens

<400> 3257

Val Val Leu Leu Val Ala Thr Glu Gly Arg Val Arg Val Asn Ser Ala
1 5 10 15

Tyr Gln Asp Lys
20

<210> 3258
<211> 18
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3258

Gly Pro Pro Gly Ala Arg Gly Leu Thr Gly Arg Pro Gly Asp Ala Gly
1 5 10 15

Pro Pro

<210> 3259
<211> 18
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3259

Gly Pro Pro Gly Ala Arg Gly Leu Thr Gly Arg Pro Gly Asp Ala Gly
1 5 10 15

Pro Pro

<210> 3260
<211> 37
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3260

Gly Pro Pro Gly Pro Pro Gly Pro Pro Gly Pro Pro Gly Pro Pro Gly
1 5 10 15

Ala Arg Gly Leu Thr Gly Arg Pro Gly Asp Ala Gly Pro Pro Gly Pro

20 25 30

Pro Gly Ala Cys Ala
35

<210> 3261
<211> 206
<212> PRT
<213> Homo sapiens

<400> 3261

Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile
1 5 10 15

Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser Gln Glu
20 25 30

Asp Pro Gln Val Gln Phe Asn Trp Tyr Val Asp Gly Val Gln Val His
35 40 45

Asn Ala Lys Thr Lys Pro Arg Glu Gln Gln Phe Asn Ser Thr Tyr Arg
50 55 60

Val Val Ser Val Leu Thr Val Leu His Gln Asn Trp Leu Asp Gly Lys
65 70 75 80

Glu Tyr Lys Cys Lys Val Ser Asn Lys Gly Leu Pro Ser Ser Ile Glu
85 90 95

Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr
100 105 110

Thr Leu Pro Pro Ser Gln Glu Glu Met Thr Lys Asn Gln Val Ser Leu
115 120 125

Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp
130 135 140

Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val
145 150 155 160

Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Arg Leu Thr Val Asp
165 170 175

Lys Ser Arg Trp Gln Glu Gly Asn Val Phe Ser Cys Ser Val Met His
180 185 190

Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu

195 200 205

<210> 3262
<211> 9
<212> PRT
<213> Burkholderia fungorum

<400> 3262

Arg Ala Gly Thr Asp Glu Gly Phe Gly
1 5

<210> 3263
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3263

Ala Phe Phe Pro Asn Met Val Asn Met Leu Val Leu Gly Lys His Leu
1 5 10 15

Gly Ile Pro Lys
20

<210> 3264
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3264

Ala Lys Tyr Asn Gln Leu Leu Arg Ile Glu Glu Glu Leu Gly Ser Lys
1 5 10 15

Ala

<210> 3265
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3265

Ala Asn Gly Trp Gly Val Met Val Ser His Arg Ser Gly Glu Thr Glu
1 5 10 15

Asp Thr

<210> 3266
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3266

Ala Pro Asp Arg Lys Gly Phe Arg Leu Leu Leu Ala Ser Pro Arg Ser
1 5 10 15

Cys Tyr Lys Leu
20

<210> 3267
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3267

Cys Leu Glu Glu Lys Val Cys Ser Leu Leu Glu Pro Leu Gly Leu Gln
1 5 10 15

Cys Thr Phe Ile
20

<210> 3268
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3268

Glu Lys Gly Val Pro Leu Tyr Arg His Ile Ala Asp Leu Ala Gly Asn
1 5 10 15

Ser Glu

<210> 3269
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3269

Glu Pro Leu Gly Leu Gln Cys Thr Phe Ile Asn Asp Phe Phe Thr Tyr
1 5 10 15

His Ile Arg His
20

<210> 3270
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3270

Glu Thr Thr Glu Glu Ser Leu Arg Asn Tyr Tyr Glu Gln
1 5 10

<210> 3271
<211> 14
<212> PRT
<213> Homo sapiens

<400> 3271

Phe Glu Glu Tyr Gly Lys Ile Asp Thr Ile Glu Ile Ile Thr
1 5 10

<210> 3272
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3272

Phe Pro Gly Leu Ile Thr Leu Thr Ile Ser Leu Leu Asp Thr Ser Asn
1 5 10 15

Leu Glu Leu Pro
20

<210> 3273
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3273

Phe Gln Glu Gln Gln Asn Glu Gly His Gly Glu Ala Leu Leu Phe Glu
1 5 10 15

Gly Ile Lys Lys
20

<210> 3274
<211> 19
<212> PRT
<213> Homo sapiens

<400> 3274

Phe Arg Ser Gly Lys Tyr Asp Leu Asp Phe Lys Ser Pro Asp Asp Pro
1 5 10 15

Ser Arg Tyr

<210> 3275
<211> 12
<212> PRT

<213> Homo sapiens

<400> 3275

Gly Ala Arg Gly Leu Thr Gly Arg Pro Gly Asp Ala
1 5 10

<210> 3276
<211> 12
<212> PRT
<213> Homo sapiens

<400> 3276

Gly Ala Arg Gly Leu Thr Gly Arg Pro Gly Asp Ala
1 5 10

<210> 3277
<211> 19
<212> PRT
<213> Homo sapiens

<400> 3277

Ile Gln Val Val Gly Asp Asp Leu Thr Val Thr Asn Pro Lys Arg Ile
1 5 10 15

Ala Lys Ala

<210> 3278
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3278

Lys Ala Ala Ser Gly Ser Thr Gly Asp Gln Lys Val Gln Ile Ser Tyr
1 5 10 15

Tyr Gly Pro Lys
20

<210> 3279
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3279

Lys Phe Ala Gly Arg Asn Phe Arg Asn Pro Leu Ala Lys
1 5 10

<210> 3280
<211> 17
<212> PRT

<213> Homo sapiens

<400> 3280

Lys Ile His Ala Arg Glu Ile Phe Asp Ser Arg Gly Asn Pro Thr Val
1 5 10 15

Glu

<210> 3281
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3281

Lys Ile His Ala Arg Glu Ile Phe Asp Ser Arg Gly Asn Pro Thr Val
1 5 10 15

Glu

<210> 3282
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3282

Lys Ile His Ala Arg Glu Ile Phe Asp Ser Arg Gly Asn Pro Thr Val
1 5 10 15

Glu

<210> 3283
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3283

Lys Ile His Ala Arg Glu Ile Phe Asp Ser Arg Gly Asn Pro Thr Val
1 5 10 15

Glu

<210> 3284
<211> 17
<212> PRT
<213> Porphyromonas gingivalis

<400> 3284

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

Glu

<210> 3285
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3285

Lys Ser Val Thr Thr Leu Ala Met Lys Ala Lys Cys Lys Leu Thr Ile
1 5 10 15

Cys Pro Glu Glu
20

<210> 3286
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3286

Leu Leu Asp Thr Ser Asn Leu Glu Leu Pro Glu Ala Val Val Phe Gln
1 5 10 15

Asp Ser Val Val
20

<210> 3287
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3287

Leu Val Asn Cys Asp Arg Asp Asn Leu Glu Ser Ser Ala Met Asp Cys
1 5 10 15

Glu Asp Asp Glu
20

<210> 3288
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3288

Asn Asp Phe Phe Thr Tyr His Ile Arg His Gly Glu Val His Cys Gly
1 5 10 15

Thr Asn Val Arg
20

<210> 3289
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3289

Asn Phe Arg Glu Ala Met Arg Ile Gly Ala Glu Val Tyr His Asn Leu
1 5 10 15

Lys Asn

<210> 3290
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3290

Asn Pro Lys Arg Ile Ala Lys Ala Val Asn Glu Lys Ser Cys Asn Cys
1 5 10 15

Leu Leu

<210> 3291
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3291

Pro Phe Gly Pro Val Ile Asn Gly Arg Cys Cys Leu Glu Glu Lys Val
1 5 10 15

Cys Ser Leu Leu
20

<210> 3292
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3292

Pro Gly Gly Lys His Asn Met Asp Phe Tyr Val Glu Ala Leu Ala Phe
1 5 10 15

Pro Asp Thr Asp

20

<210> 3293
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3293

Arg Asp Tyr Phe Glu Glu Tyr Gly Lys Ile Asp Thr Ile Glu Ile Ile
1 5 10 15

Thr

<210> 3294
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3294

Ser Ile Asn Ala Ser Pro Gly Val Val Val Asp Ile Ala His Ser Pro
1 5 10 15

Pro Ala Lys Lys
20

<210> 3295
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3295

Val Asp Leu Phe Thr Ser Lys Gly Leu Phe Arg Ala Ala Val Pro Ser
1 5 10 15

Gly

<210> 3296
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3296

Val Glu Ala Leu Ala Phe Pro Asp Thr Asp Phe Pro Gly Leu Ile Thr
1 5 10 15

Leu Thr Ile Ser
20

<210> 3297
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3297

Val Leu Asp Ser Glu Asp Leu Gln Asp Met Ser Leu Met Thr Leu Ser
1 5 10 15

Thr Lys Thr Pro
20

<210> 3298
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3298

Val Arg Val Phe Gln Ala Thr Arg Gly Lys Leu Ser Ser Lys Cys Ser
1 5 10 15

Val Val Leu Gly
20

<210> 3299
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3299

Trp Gly Pro Cys Gly Gln Gly Ala Ile Leu Leu Val Asn Cys Asp Arg
1 5 10 15

Asp Asn Leu Glu
20

<210> 3300
<211> 21
<212> PRT
<213> Homo sapiens

<400> 3300

Tyr Glu Ala Leu Glu Leu Arg Asp Asn Asp Lys Thr Arg Tyr Met Gly
1 5 10 15

Lys Gly Val Ser Lys
20

<210> 3301
<211> 25
<212> PRT

<213> Homo sapiens

<400> 3301

Ala Cys Leu Asp Val Gly Ala Val Ile Ala Thr Pro Glu Gln Leu Phe
1 5 10 15

Ala Ala Tyr Glu Asp Gly Phe Glu Gln
20 25

<210> 3302
<211> 24
<212> PRT
<213> Homo sapiens

<400> 3302

Asp Phe Asp Arg Ala Gln Arg Ala Cys Leu Gln Asn Ser Ala Ile Ile
1 5 10 15

Ala Thr Pro Glu Gln Leu Gln Ala
20

<210> 3303
<211> 25
<212> PRT
<213> Homo sapiens

<400> 3303

Phe Ala Ala Tyr Glu Asp Gly Phe Glu Gln Cys Asp Ala Gly Trp Leu
1 5 10 15

Ala Asp Gln Thr Val Arg Tyr Pro Ile
20 25

<210> 3304
<211> 25
<212> PRT
<213> Mus musculus

<400> 3304

Phe Ala Ala Tyr Glu Asp Gly Phe Glu Gln Cys Asp Ala Gly Trp Leu
1 5 10 15

Ser Asp Gln Thr Val Arg Tyr Pro Ile
20 25

<210> 3305
<211> 25
<212> PRT
<213> Homo sapiens

<400> 3305

Phe Asp Gln Cys Asp Tyr Gly Trp Leu Ser Asp Ala Ser Val Arg His
1 5 10 15

Pro Val Thr Val Ala Arg Ala Gln Cys
20 25

<210> 3306
<211> 25
<212> PRT
<213> Homo sapiens

<400> 3306

Gly Val Arg Thr Leu Tyr Arg Phe Glu Asn Gln Thr Gly Phe Pro Pro
1 5 10 15

Pro Asp Ser Arg Phe Asp Ala Tyr Cys
20 25

<210> 3307
<211> 24
<212> PRT
<213> Homo sapiens

<400> 3307

His Gln Cys Asp Ala Gly Trp Leu Ala Asp Gln Thr Val Arg Tyr Pro
1 5 10 15

Ile His Thr Pro Arg Glu Gly Cys
20

<210> 3308
<211> 23
<212> PRT
<213> Mus musculus

<400> 3308

Ile Ala Ser Pro Glu Gln Leu Phe Ala Ala Tyr Glu Asp Gly Phe Glu
1 5 10 15

Gln Cys Asp Ala Gly Trp Leu
20

<210> 3309
<211> 23
<212> PRT
<213> Mus musculus

<400> 3309

Ile Ala Thr Pro Glu Gln Leu Gln Ala Ala Tyr Glu Asp Gly Phe His
1 5 10 15

Gln Cys Asp Ala Gly Trp Leu
20

<210> 3310
<211> 24
<212> PRT
<213> Homo sapiens

<400> 3310

Ile Ala Thr Pro Glu Gln Leu Gln Ala Ala Tyr Glu Asp Gly Phe His
1 5 10 15

Gln Cys Asp Ala Gly Trp Leu Ala
20

<210> 3311
<211> 24
<212> PRT
<213> Homo sapiens

<400> 3311

Leu Ala Asp Arg Ser Val Arg Tyr Pro Ile Ser Lys Ala Arg Pro Asn
1 5 10 15

Cys Gly Gly Asn Leu Leu Gly Val
20

<210> 3312
<211> 25
<212> PRT
<213> Homo sapiens

<400> 3312

Leu His Lys Val Lys Val Gly Lys Ser Pro Pro Val Arg Gly Ser Leu
1 5 10 15

Ser Gly Lys Val Ser Leu Pro Cys His
20 25

<210> 3313
<211> 24
<212> PRT
<213> Homo sapiens

<400> 3313

Pro Ile His Thr Pro Arg Glu Gly Cys Tyr Gly Asp Lys Asp Glu Phe
1 5 10 15

Pro Gly Val Arg Thr Tyr Gly Ile

20

<210> 3314
<211> 25
<212> PRT
<213> Homo sapiens

<400> 3314

Pro Pro Asp Ser Arg Phe Asp Ala Tyr Cys Phe Lys Arg Arg Met Ser
1 5 10 15

Asp Leu Ser Val Ile Gly His Pro Ile
20 25

<210> 3315
<211> 25
<212> PRT
<213> Mus musculus

<400> 3315

Gln Ala Ala Tyr Glu Asp Gly Phe His Gln Cys Asp Ala Gly Trp Leu
1 5 10 15

Ala Asp Gln Thr Val Arg Tyr Pro Ile
20 25

<210> 3316
<211> 25
<212> PRT
<213> Homo sapiens

<400> 3316

Arg Leu Ala Thr Val Gly Glu Leu Gln Ala Ala Trp Arg Asn Gly Phe
1 5 10 15

Asp Gln Cys Asp Tyr Gly Trp Leu Ser
20 25

<210> 3317
<211> 24
<212> PRT
<213> Homo sapiens

<400> 3317

Arg Val Ser Lys Glu Lys Glu Val Val Leu Leu Val Ala Thr Glu Gly
1 5 10 15

Arg Val Arg Val Asn Ser Ala Tyr
20

<210> 3318
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3318

Ser Asp Leu Ser Val Ile Gly His Pro Ile Asp Ser Glu
1 5 10

<210> 3319
<211> 24
<212> PRT
<213> Homo sapiens

<400> 3319

Tyr Leu Ala Trp Gln Ala Gly Met Asp Met Cys Ser Ala Gly Trp Leu
1 5 10 15

Ala Asp Arg Ser Val Arg Tyr Pro
20

<210> 3320
<211> 20
<212> PRT
<213> Mus musculus

<400> 3320

His Gln Cys His Gln Glu Ser Thr Gly Arg Ser Arg Gly Arg Cys Gly
1 5 10 15

Arg Ser Gly Ser
20

<210> 3321
<211> 21
<212> PRT
<213> Mus musculus

<400> 3321

His Gln Cys His Gln Glu Ser Thr Lys Gly Lys Ser Lys Gly Lys Cys
1 5 10 15

Gly Lys Ser Gly Ser
20

<210> 3322
<211> 21
<212> PRT
<213> Mus musculus

<400> 3322

His Gln Cys His Gln Glu Ser Thr Lys Gly Lys Ser Lys Gly Lys Cys
1 5 10 15

Gly Lys Ser Gly Ser
20

<210> 3323
<211> 19
<212> PRT
<213> Mus musculus

<400> 3323

Ser His Gln Glu Ser Thr Lys Gly Lys Ser Lys Gly Lys Ser Gly Lys
1 5 10 15

Ser Gly Ser

<210> 3324
<211> 19
<212> PRT
<213> Mus musculus

<400> 3324

Ser His Gln Glu Ser Thr Lys Gly Lys Ser Lys Gly Lys Ser Gly Lys
1 5 10 15

Ser Gly Ser

<210> 3325
<211> 7
<212> PRT
<213> Homo sapiens

<400> 3325

Cys Ser Val Met His Glu Ala
1 5

<210> 3326
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3326

Phe Arg Val Val Ser Val Leu
1 5

<210> 3327
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3327

His Asn Ala Lys Thr Lys Leu
1 5

<210> 3328
<211> 7
<212> PRT
<213> Homo sapiens

<400> 3328

Met His Glu Ala Leu His Asn
1 5

<210> 3329
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3329

Pro Arg Glu Gln Gln Phe Asn
1 5

<210> 3330
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3330

Gln Gln Phe Asn Ser Thr Phe
1 5

<210> 3331
<211> 7
<212> PRT
<213> Homo sapiens

<400> 3331

Ser Val Met His Glu Ala Leu
1 5

<210> 3332
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3332

Thr Phe Arg Val Val Ser Val
1 5

<210> 3333
<211> 7
<212> PRT
<213> Homo sapiens

<400> 3333

Val Leu Thr Val Leu His Gln
1 5

<210> 3334
<211> 7
<212> PRT
<213> Homo sapiens

<400> 3334

Val Met His Glu Ala Leu His
1 5

<210> 3335
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3335

Asp Lys Lys Arg Glu Glu Ala Pro Ser Leu Arg Pro Ala Pro Pro
1 5 10 15

<210> 3336
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3336

Asp Ser Pro Gly Ser Gly Asn Ala Arg Pro Asn Asn Pro Asp Trp
1 5 10 15

<210> 3337
<211> 14
<212> PRT
<213> Homo sapiens

<400> 3337

Glu Gln Ser Ala Asp Ser Ser Arg His Ser Gly Ser Gly His
1 5 10

<210> 3338
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3338

Glu Arg Gly Ser Ala Gly His Trp Thr Ser Glu Ser Ser Val Ser
1 5 10 15

<210> 3339
<211> 14
<212> PRT
<213> Homo sapiens

<400> 3339

Glu Ser Ser Arg Asp Gly Ser Arg His Pro Arg Ser His Asp
1 5 10

<210> 3340
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3340

Gly Asp Lys Glu Leu Arg Thr Gly Lys Glu Lys Val Thr Ser Gly
1 5 10 15

<210> 3341
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3341

Gly Pro Arg Val Val Glu Arg His Gln Ser Ala Cys Lys Asp Ser
1 5 10 15

<210> 3342
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3342

Gly Thr Phe Glu Glu Val Ser Gly Asn Val Ser Pro Gly Thr Arg
1 5 10 15

<210> 3343

<211> 15
<212> PRT
<213> Homo sapiens

<400> 3343

Ile Glu Val Leu Lys Arg Lys Val Ile Glu Lys Val Gln His Ile
1 5 10 15

<210> 3344
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3344

Leu Glu Asn Leu Arg Ser Lys Ile Gln Lys Leu Glu Ser Asp Val
1 5 10 15

<210> 3345
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3345

Leu Leu Gln Gln Glu Arg Pro Ile Arg Asn Ser Val Asp Glu Leu
1 5 10 15

<210> 3346
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3346

Met Glu Leu Glu Arg Pro Gly Gly Asn Glu Ile Thr Arg Gly Gly
1 5 10 15

<210> 3347
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3347

Asn Arg Cys His Ala Ala Asn Pro Asn Gly Arg Tyr Tyr Trp Gly
1 5 10 15

<210> 3348
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3348

Pro Glu Trp Lys Ala Leu Thr Asp Met Pro Gln Met Arg Met Glu
1 5 10 15

<210> 3349
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3349

Pro Arg Lys Gln Cys Ser Lys Glu Asp Gly Gly Gly Trp Trp Tyr
1 5 10 15

<210> 3350
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3350

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

<210> 3351
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3351

Gln Asn Pro Gly Ser Pro Arg Pro Gly Ser Thr Gly Thr Trp Asn
1 5 10 15

<210> 3352
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3352

Arg Gly His Ala Lys Ser Arg Pro Val Arg Gly Ile His Thr Ser
1 5 10 15

<210> 3353
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3353

Arg Pro Ala Pro Pro Pro Ile Ser Gly Gly Gly Tyr Arg Ala Arg
1 5 10 15

<210> 3354
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3354

Ser Cys Ser Arg Ala Leu Ala Arg Glu Val Asp Leu Lys Asp Tyr
1 5 10 15

<210> 3355
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3355

Ser Gly Cys Arg Met Lys Gly Leu Ile Asp Glu Val Asn Gln Asp
1 5 10 15

<210> 3356
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3356

Ser Gly Ile Gly Thr Leu Asp Gly Phe Arg His Arg His Pro Asp
1 5 10 15

<210> 3357
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3357

Ser Arg Gly Ser Glu Ser Gly Ile Phe Thr Asn Thr Lys Glu Ser
1 5 10 15

<210> 3358
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3358

Ser Ser His His Pro Gly Ile Ala Glu Phe Pro Ser Arg Gly Lys
1 5 10 15

<210> 3359
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3359

Ser Tyr Asn Arg Gly Asp Ser Thr Phe Glu Ser Lys Ser Tyr Lys
1 5 10 15

<210> 3360
<211> 14
<212> PRT

<213> Homo sapiens

<400> 3360

Thr Gly Ser Ser Thr Gly Gly Arg Gln Gly Ser His His Glu
1 5 10

<210> 3361
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3361

Thr Ile His Ala His Pro Gly Ser Arg Arg Gly Gly Arg His Gly Tyr
1 5 10 15

His His

<210> 3362
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3362

Thr Thr Arg Arg Ser Cys Ser Lys Thr Val Thr Lys Thr Val Ile
1 5 10 15

<210> 3363
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3363

Val Asp Ile Asp Ile Lys Ile Arg Ser Cys Arg Gly Ser Cys Ser
1 5 10 15

<210> 3364
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3364

Val Ile Gln Asn Arg Gln Asp Gly Ser Val Asp Phe Gly Arg Lys
1 5 10 15

<210> 3365
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3365

Trp Tyr Asn Arg Cys His Ala Ala Asn Pro Asn Gly Arg Tyr Tyr
1 5 10 15

<210> 3366
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3366

Trp Tyr Ser Met Arg Lys Met Ser Met Lys Ile Arg Pro Phe Phe
1 5 10 15

<210> 3367
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3367

Gly Gly Gly Tyr Arg Ala Arg Pro Ala Lys Ala Ala Ala Thr Gln
1 5 10 15

<210> 3368
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3368

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

<210> 3369
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3369

Tyr Ala Glu Tyr His Phe Arg Val Gly Ser Glu Ala Glu Gly Tyr
1 5 10 15

<210> 3370
<211> 20
<212> PRT
<213> Porphyromonas gingivalis

<400> 3370

Thr Leu Val Val Asn Arg Leu Arg Gly Ser Leu Lys Ile Cys Ala Val
1 5 10 15

Lys Ala Pro Gly
20

<210> 3371
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3371

Lys Ile His Ala Arg Glu Ile Phe Asp Ser Arg Gly Asn Pro Thr Val
1 5 10 15

Glu

<210> 3372
<211> 19
<212> PRT
<213> Homo sapiens

<400> 3372

Ala Asn Lys Tyr Gln Ile Ser Val Asn Lys Tyr Arg Gly Thr Ala Gly
1 5 10 15

Asn Ala Leu

<210> 3373
<211> 30
<212> PRT
<213> Homo sapiens

<400> 3373

Lys Tyr Gln Ile Ser Val Asn Lys Tyr Arg Gly Thr Ala Gly Asn Ala
1 5 10 15

Leu Met Asp Gly Ala Ser Gln Leu Met Gly Glu Asn Arg Thr
20 25 30

<210> 3374
<211> 30
<212> PRT
<213> Homo sapiens

<400> 3374

Lys Tyr Gln Ile Ser Val Asn Lys Tyr Arg Gly Thr Ala Gly Asn Ala
1 5 10 15

Leu Met Asp Gly Ala Ser Gln Leu Met Gly Glu Asn Arg Thr
20 25 30

<210> 3375
<211> 18
<212> PRT

<213> Homo sapiens

<400> 3375

Asn Lys Tyr Arg Gly Thr Ala Gly Asn Ala Leu Met Asp Gly Ala Ser
1 5 10 15

Gln Leu

<210> 3376
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3376

Asn Lys Tyr Arg Gly Thr Ala Gly Asn Ala Leu Met Asp Gly Ala Ser
1 5 10 15

Gln Leu

<210> 3377
<211> 10
<212> PRT
<213> Homo sapiens

<400> 3377

Leu Val Val Tyr Pro Trp Thr Gln Arg Phe
1 5 10

<210> 3378
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3378

Gln Val Thr Gln Pro Thr Val Gly Met Asn Phe Lys Thr Pro Arg Gly
1 5 10 15

Pro Val

<210> 3379
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3379

Arg Leu Pro Ile Ile Asp Val Ala Pro Leu Asp Val Gly Ala Pro Asp
1 5 10 15

<210> 3380
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3380

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

<210> 3381
<211> 9
<212> PRT
<213> Human herpesvirus

<400> 3381

Gly Gln Ser Arg Gly Gln Ser Arg Gly
1 5

<210> 3382
<211> 21
<212> PRT
<213> Human herpesvirus

<400> 3382

Gly Gln Ser Arg Gly Gln Ser Arg Gly Arg Gly Arg Gly Arg Gly Arg
1 5 10 15

Gly Arg Gly Lys Gly
20

<210> 3383
<211> 15
<212> PRT
<213> Human herpesvirus

<400> 3383

Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Gly Gly Arg Gly
1 5 10 15

<210> 3384
<211> 8
<212> PRT
<213> Homo sapiens

<400> 3384

Asp Leu Leu Pro Ser Arg Asp Arg
1 5

<210> 3385
<211> 8
<212> PRT

<213> Homo sapiens

<400> 3385

Asp Leu Leu Pro Ser Arg Asp Arg
1 5

<210> 3386
<211> 9
<212> PRT
<213> Homo sapiens

<400> 3386

Asp Arg Gln His Leu Pro Leu Ile Lys
1 5

<210> 3387
<211> 24
<212> PRT
<213> Homo sapiens

<400> 3387

Glu Glu Ala Pro Ser Leu Arg Pro Ala Pro Pro Pro Ile Ser Gly Gly
1 5 10 15

Gly Tyr Arg Ala Arg Pro Ala Lys
20

<210> 3388
<211> 24
<212> PRT
<213> Homo sapiens

<400> 3388

Glu Glu Ala Pro Ser Leu Arg Pro Ala Pro Pro Pro Ile Ser Gly Gly
1 5 10 15

Gly Tyr Arg Ala Arg Pro Ala Lys
20

<210> 3389
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3389

Glu Ser Ser Ser His His Pro Gly Ile Ala Glu Phe Pro Ser Arg Gly
1 5 10 15

Lys

<210> 3390
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3390

Lys Asp Leu Leu Pro Ser Arg Asp Arg Gln His Leu Pro Leu Ile
1 5 10 15

<210> 3391
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3391

Lys Asp Leu Leu Pro Ser Arg Asp Arg Gln His Leu Pro Leu Ile
1 5 10 15

<210> 3392
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3392

Lys Glu Ser Ser Ser His His Pro Gly Ile Ala Glu Phe Pro Ser Arg
1 5 10 15

Gly

<210> 3393
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3393

Lys Gln Phe Thr Ser Ser Thr Ser Tyr Asn Arg Gly Asp Ser Thr Phe
1 5 10 15

Glu Ser

<210> 3394
<211> 21
<212> PRT
<213> Homo sapiens

<400> 3394

Lys Gln Phe Thr Ser Ser Thr Ser Tyr Asn Arg Gly Asp Ser Thr Phe
1 5 10 15

Glu Ser Lys Ser Tyr
            20

<210> 3395
<211> 25
<212> PRT
<213> Homo sapiens

<400> 3395

Lys Arg Glu Glu Ala Pro Ser Leu Arg Pro Ala Pro Pro Pro Ile Ser
1   5   10   15

Gly Gly Gly Tyr Arg Ala Arg Pro Ala
            20   25

<210> 3396
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3396

Gln Phe Thr Ser Ser Thr Ser Tyr Asn Arg Gly Asp Ser Thr Phe Glu
1   5   10   15

Ser Lys

<210> 3397
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3397

Thr Ser Ser Thr Ser Tyr Asn Arg Gly Asp Ser Thr Phe
1   5   10

<210> 3398
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3398

Gly Val Tyr Ala Thr Arg Ser Ser Ala Val Arg Leu Arg Ser Ser Val
1   5   10   15

<210> 3399
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3399

Met Ser Thr Arg Ser Val Ser Ser Ser Ser Tyr Arg Arg Met Phe Gly
1 5 10 15

<210> 3400
<211> 20
<212> PRT
<213> Bos taurus

<400> 3400

Met Ser Gly Arg Gly Lys Gln Gly Gly Lys Ala Arg Ala Lys Ala Lys
1 5 10 15

Thr Arg Ser Ser
20

<210> 3401
<211> 3
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3401

Ala Ala Ala
1

<210> 3402
<211> 38
<212> PRT
<213> Mus musculus

<400> 3402

Lys Gly Ser Ile Thr Ser Val Gln Ala Ile Tyr Val Pro Ala Asp Asp
1 5 10 15

Leu Thr Asp Pro Ala Pro Ala Thr Thr Phe Ala His Leu Asp Ala Thr
20 25 30

Thr Val Leu Ser Arg Ala
35

<210> 3403
<211> 16
<212> PRT
<213> Mus musculus

<400> 3403

Lys Leu Val Ile Ile Glu Ser Asp Leu Glu Arg Ala Glu Glu Arg Ala
1 5 10 15

<210> 3404
<211> 26
<212> PRT
<213> Mus musculus

<400> 3404

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

Glu Glu Asp Lys Leu Thr Val Ser Arg Ala
20 25

<210> 3405
<211> 18
<212> PRT
<213> Mus musculus

<400> 3405

Arg Ile Met Asn Val Ile Gly Glu Pro Ile Asp Glu Arg Gly Pro Ile
1 5 10 15

Lys Thr

<210> 3406
<211> 16
<212> PRT
<213> Mus musculus

<400> 3406

Arg Ser Ile Thr Thr Ile Ile Asp Thr Phe His Gln Tyr Ser Arg Lys
1 5 10 15

<210> 3407
<211> 32
<212> PRT
<213> Mus musculus

<400> 3407

Arg Thr Thr Gly Ile Val Leu Asp Ser Gly Asp Gly Val Thr His Asn
1 5 10 15

Val Pro Ile Tyr Glu Gly Tyr Ala Leu Pro His Ala Ile Met Arg Leu
20 25 30

<210> 3408
<211> 16
<212> PRT
<213> Mycobacterium tuberculosis

<400> 3408

Gly Leu Glu Pro Gly Val Val Ala Glu Lys Val Arg Asn Leu Ser Val
1 5 10 15

<210> 3409
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3409

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

Pro Gly

<210> 3410
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3410

Ala Gly Tyr Ala Leu Ala Gln Met Gly Arg Leu Lys Gly Pro Leu Leu
1 5 10 15

<210> 3411
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3411

Ala Ile Ser Asp Tyr Val Phe Asn Thr Ala Ser Leu Val Tyr His Glu
1 5 10 15

Glu

<210> 3412
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3412

Ala Lys Asn Ser Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp
1 5 10 15

Thr

<210> 3413
<211> 16

<212> PRT
<213> Homo sapiens

<400> 3413

Ala Leu Ala Thr Ile Ser Thr Leu Glu Ala Val Arg Gly Arg Pro Phe
1 5 10 15

<210> 3414
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3414

Ala Leu Thr Asn Gly Ile Tyr Pro His Lys Leu Val Phe
1 5 10

<210> 3415
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3415

Ala Met Lys Ala Ala Met Ala Leu Glu Lys Lys Leu Asn Gln Ala Leu
1 5 10 15

Leu

<210> 3416
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3416

Ala Asn Gly Val Ile His Met Leu Asp Gly Ile Leu Leu Pro Pro Thr
1 5 10 15

<210> 3417
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3417

Ala Asn Leu Glu Leu Ile Asn Thr Trp Val Ala Lys Asn Thr Asn
1 5 10 15

<210> 3418
<211> 14
<212> PRT
<213> Homo sapiens

<400> 3418

Ala Pro Glu Leu Leu Phe Phe Ala Lys Arg Tyr Lys Ala Ala
1 5 10

<210> 3419
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3419

Ala Pro Arg Leu Leu Ile Tyr Asp Ala Ser Asn Arg Ala Thr Gly
1 5 10 15

<210> 3420
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3420

Ala Pro Ser Ala Ile Leu Pro Leu Pro Gly Gln Ser Val Glu Arg
1 5 10 15

<210> 3421
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3421

Ala Pro Val Glu Leu Ile Leu Ser Asp Glu Thr Leu Pro Ala Pro Glu
1 5 10 15

<210> 3422
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3422

Ala Arg Thr Gln Leu Ser Trp Leu Lys Lys Gln Leu Ala Ala Ala
1 5 10 15

<210> 3423
<211> 14
<212> PRT
<213> Homo sapiens

<400> 3423

Ala Ser His Phe Glu Gln Met Ala Ala Ala Ser Met His Arg
1 5 10

<210> 3424
<211> 16
<212> PRT

<213> Homo sapiens

<400> 3424

Ala Tyr Pro Arg Ile Ser Val Asn Asn Val Leu Pro Val Phe Asp Asn
1 5 10 15

<210> 3425
<211> 24
<212> PRT
<213> Homo sapiens

<400> 3425

Asp Asp Asp Gly Thr Gly Gln Lys Gln Ile Trp Arg Ile Glu Gly Ser
1 5 10 15

Asn Lys Val Pro Val Asp Pro Ala
20

<210> 3426
<211> 19
<212> PRT
<213> Homo sapiens

<400> 3426

Asp Asp Leu Lys Thr Asp Phe Tyr Lys Asp Leu Thr Ser Leu Gly His
1 5 10 15

Asn Glu Asn

<210> 3427
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3427

Asp Glu Pro Gln Tyr Leu Asp Leu Pro Ser Thr Ala Thr Ser Val Asn
1 5 10 15

<210> 3428
<211> 14
<212> PRT
<213> Homo sapiens

<400> 3428

Asp Phe Asn Val Gly Gly Tyr Ile Gln Ala Val Leu Asp Arg
1 5 10

<210> 3429
<211> 16
<212> PRT

<213> Homo sapiens

<400> 3429

Asp Gly Lys Arg Ile Gln Tyr Gln Leu Val Asp Ile Ser Gln Asp Asn
1 5 10 15

<210> 3430
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3430

Asp Gly Val Arg Glu Val Phe Glu Met Ala Thr Arg Ala Ala Leu Gln
1 5 10 15

Ala

<210> 3431
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3431

Asp His Pro Thr Phe Asn Lys Ile Thr Pro Asn Leu Ala Glu Phe
1 5 10 15

<210> 3432
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3432

Asp His Val Lys Leu Val Asn Glu Val Thr Glu Phe Ala Lys Thr
1 5 10 15

<210> 3433
<211> 14
<212> PRT
<213> Homo sapiens

<400> 3433

Asp Ile Arg Pro Glu Ile His Glu Asn Tyr Arg Ile Asn Gly
1 5 10

<210> 3434
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3434

Asp Lys Val Leu Ile Arg Ile Met Val Ser Arg Ser Glu Val Asp
1 5 10 15

<210> 3435
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3435

Glu Glu Val Lys Leu Ile Lys Lys Met Gly Asp His Leu Thr Asn Leu
1 5 10 15

His

<210> 3436
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3436

Glu Gly Ala Arg Asn Ile Val Ala Ala Met Lys Ala His Gly Val Asp
1 5 10 15

<210> 3437
<211> 12
<212> PRT
<213> Homo sapiens

<400> 3437

Glu Ile Ile Asn Trp Leu Asp Lys Asn Gln Thr Ala
1 5 10

<210> 3438
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3438

Glu Asn Ile Pro Phe Thr Leu Pro Glu Val Ser Thr Asn Lys Thr
1 5 10 15

<210> 3439
<211> 19
<212> PRT
<213> Homo sapiens

<400> 3439

Glu Pro His Arg His Ser Ile Phe Thr Pro Glu Thr Asn Pro Arg Ala
1 5 10 15

Gly Leu Glu

<210> 3440
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3440

Glu Gln Leu Gly Glu Tyr Lys Phe Gln Asn Ala Leu Leu Val Arg Tyr
1 5 10 15

Thr Lys

<210> 3441
<211> 14
<212> PRT
<213> Homo sapiens

<400> 3441

Glu Arg Asn Leu Val Ser Trp Glu Ser Gln Thr Gln Pro Gln
1 5 10

<210> 3442
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3442

Glu Arg Thr Ile Thr Met His Lys Asp Ser Thr Gly His Val Gly
1 5 10 15

<210> 3443
<211> 11
<212> PRT
<213> Homo sapiens

<400> 3443

Glu Thr Phe Leu Lys Asp Leu Pro Ile Met Phe
1 5 10

<210> 3444
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3444

Glu Thr Tyr Gly Glu Met Ala Asp Cys Cys Ala Lys Gln
1 5 10

<210> 3445
<211> 12
<212> PRT
<213> Homo sapiens

<400> 3445

Glu Val Glu Asn Ala Val Leu Gly Lys Asp Phe Lys
1 5 10

<210> 3446
<211> 22
<212> PRT
<213> Homo sapiens

<400> 3446

Phe Glu Lys Ser Lys Glu Gln Leu Thr Pro Leu Ile Lys Lys Ala Gly
1 5 10 15

Thr Glu Leu Val Asn Phe
20

<210> 3447
<211> 14
<212> PRT
<213> Homo sapiens

<400> 3447

Phe Glu Pro Phe Phe Met Met Ile Ala Thr Pro Ala Pro His
1 5 10

<210> 3448
<211> 21
<212> PRT
<213> Homo sapiens

<400> 3448

Phe Leu Glu Gln Gln Asn Lys Ile Leu Leu Ala Glu Leu Glu Gln Leu
1 5 10 15

Lys Gly Gln Gly Lys
20

<210> 3449
<211> 9
<212> PRT
<213> Homo sapiens

<400> 3449

Phe Leu Leu Phe Pro Asp Met Glu Ala
1 5

<210> 3450
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3450

Phe Pro Gly Phe Leu Glu Asn Gln Lys Asp Pro Leu Ala Val Asp Lys
1 5 10 15

<210> 3451
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3451

Phe Gln Asn Ala Leu Leu Val Arg Tyr Thr Lys Lys Val Pro Gln Val
1 5 10 15

Ser

<210> 3452
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3452

Phe Arg Gly Gln Tyr Cys Tyr Glu Leu Asp Glu Lys Ala Val Arg Pro
1 5 10 15

Gly

<210> 3453
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3453

Phe Arg Gly Gln Tyr Cys Tyr Glu Leu Asp Glu Lys Ala Val Arg Pro
1 5 10 15

Gly

<210> 3454
<211> 12
<212> PRT
<213> Homo sapiens

<400> 3454

Phe Ser Ile Ser Pro Asn Ala Val Ser Ala Glu Glu
1 5 10

<210> 3455
<211> 12
<212> PRT
<213> Homo sapiens

<400> 3455

Phe Ser Ser Glu Glu Ser Asn Leu Gly Ala Asn Asn
1 5 10

<210> 3456
<211> 10
<212> PRT
<213> Homo sapiens

<400> 3456

Phe Val Glu Leu Gly Thr Gln Pro Ala Thr
1 5 10

<210> 3457
<211> 14
<212> PRT
<213> Homo sapiens

<400> 3457

Gly Ala Tyr Tyr Leu Lys Leu Glu Asn Gln Ser Leu Lys Ser
1 5 10

<210> 3458
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3458

Gly Asp Ile Gln Gln Phe Leu Ile Thr Gly Asp Pro Lys Ala Ala Tyr
1 5 10 15

Asp

<210> 3459
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3459

Gly Glu Thr Ser Glu Met Tyr Leu Ile Gln Pro Asp Ser Ser Val Lys
1 5 10 15

Pro Tyr

<210> 3460
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3460

Gly Gly Gly Tyr Val Lys Leu Phe Pro Asn Ser Leu Asp Gln Thr
1 5 10 15

<210> 3461
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3461

Gly Gly His Ala Ile Arg Ile Leu Gly Trp Gly Val Glu Asn Gly Thr
1 5 10 15

Pro Tyr

<210> 3462
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3462

Gly Gly Gln Phe Leu Arg Ala Val Ala Gln Arg Cys Pro Ser Pro Pro
1 5 10 15

<210> 3463
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3463

Gly His Leu Ser Phe Gly Phe Met Gln Asp Leu Gln Gln Lys Val Val
1 5 10 15

Tyr

<210> 3464
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3464

Gly Ile Lys Ser Leu Val Ser Lys Gly Thr Leu Val Gln Thr Lys Gly
1 5 10 15

<210> 3465
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3465

Gly Leu Lys Ser Leu Val Ser Lys Gly Thr Leu Val Gln Thr Lys Gly
1 5 10 15

<210> 3466
<211> 14
<212> PRT
<213> Homo sapiens

<400> 3466

Gly Leu Leu Trp Ile Ala Leu His Gly Asn Gln Ile Thr Ser
1 5 10

<210> 3467
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3467

Gly Asn Gln Phe Trp Ala Ile Arg Gly Asn Glu Val Arg Ala Gly
1 5 10 15

<210> 3468
<211> 12
<212> PRT
<213> Homo sapiens

<400> 3468

Gly Asn Arg Ile Ala Gln Trp Gln Ser Phe Gln Leu
1 5 10

<210> 3469
<211> 22
<212> PRT
<213> Homo sapiens

<400> 3469

Gly Pro Asp Pro Ser Ser Pro Ala Phe Arg Ile Glu Asp Ala Asn Leu
1 5 10 15

Ile Pro Pro Val Pro Asp
20

<210> 3470
<211> 19
<212> PRT
<213> Homo sapiens

<400> 3470

Gly Pro Gly Ile Pro Gly Arg Phe Thr Lys Glu Ala Gly Thr Leu Ala
1 5 10 15

Tyr Tyr Glu

<210> 3471
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3471

Gly Pro Val Lys Val Trp Gly Ser Ile Lys Gly Leu Thr Glu Gly
1 5 10 15

<210> 3472
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3472

Gly Gln Tyr Cys Tyr Glu Leu Asp Glu Lys Ala Val Arg Pro Gly
1 5 10 15

<210> 3473
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3473

Gly Ser Ala Gly His Trp Thr Ser Glu Ser Ser Val Ser Gly Ser Thr
1 5 10 15

Gly

<210> 3474
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3474

Gly Ser His Ser Leu Lys Tyr Phe His Thr Ser Val Ser Arg Pro Gly
1 5 10 15

<210> 3475
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3475

Gly Thr Asp Val Pro Lys Trp Ile Ser Ile Met Thr Glu Arg Ser Val
1 5 10 15

Pro His

<210> 3476
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3476

Gly Thr Gly Glu Asn Tyr Arg Gly Asn Val Ala Val Thr Val Ser Gly
1 5 10 15

His Thr

<210> 3477
<211> 19
<212> PRT
<213> Homo sapiens

<400> 3477

Gly Val Asp Glu Val Thr Ile Val Asn Ile Leu Thr Asn Arg Ser Asn
1 5 10 15

Ala Gln Arg

<210> 3478
<211> 12
<212> PRT
<213> Homo sapiens

<400> 3478

Gly Val Ile Lys Val Phe Asn Asp Met Lys Val Arg
1 5 10

<210> 3479
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3479

Gly Tyr Val Arg Asp Glu Thr Val Arg Ala Ala Pro Tyr
1 5 10

<210> 3480
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3480

His Leu Pro Asp Asn Ile Asn Val Tyr Ala Thr Thr Ala Ala Asn Pro
1 5 10 15

Arg Glu

<210> 3481
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3481

His Asn Gly Asn Leu Ile Pro Thr His Thr Gln Pro Ser Tyr Arg Phe
1 5 10 15

<210> 3482
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3482

Ile Gly Gly Val Ile Leu Phe His Glu Thr Leu Tyr Gln Lys Ala Asp
1 5 10 15

Asp

<210> 3483
<211> 14
<212> PRT
<213> Homo sapiens

<400> 3483

Ile Lys Ile Ile Ser Lys Ile Glu Asn His Glu Gly Val Arg
1 5 10

<210> 3484
<211> 14
<212> PRT
<213> Homo sapiens

<400> 3484

Ile Leu Glu Trp Ala Ala Glu Arg Gly Pro Ile Thr Ser Ala
1 5 10

<210> 3485
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3485

Ile Gln Ser Thr Tyr Asp Gln Asp His Thr Val Pro Ala Tyr Val Pro
1 5 10 15

Arg

<210> 3486
<211> 12
<212> PRT
<213> Homo sapiens

<400> 3486

Ile Ser Thr Pro Glu Glu Leu Gly Leu Asp Lys Val
1 5 10

<210> 3487
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3487

Ile Val His Arg Tyr Met Thr Ile Thr Ser Glu Arg Ser Val Pro Ala
1 5 10 15

<210> 3488
<211> 11
<212> PRT
<213> Homo sapiens

<400> 3488

Ile Tyr Val Phe His Thr Leu Gly Gln Tyr Phe
1 5 10

<210> 3489
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3489

Lys Ile Gly Arg Phe Val Ile Glu Glu Val Pro Gly Glu Leu Met
1 5 10 15

<210> 3490
<211> 24
<212> PRT
<213> Homo sapiens

<400> 3490

Lys Lys Val Pro Gln Val Ser Thr Pro Thr Leu Val Glu Val Ser Arg
1 5 10 15

Asn Leu Gly Lys Val Gly Ser Lys
20

<210> 3491
<211> 14
<212> PRT
<213> Homo sapiens

<400> 3491

Lys Pro Gln Tyr Met Val Leu Val Pro Ser Leu Leu His Thr
1 5 10

<210> 3492
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3492

Lys Thr Gly Lys Leu Val Ser Leu Ser Ala Gln Asn Leu Val Asp Cys
1 5 10 15

<210> 3493
<211> 14
<212> PRT
<213> Homo sapiens

<400> 3493

Leu Ala Glu Phe Ala Phe Ser Leu Tyr Arg Gln Leu Ala His
1 5 10

<210> 3494
<211> 14
<212> PRT
<213> Homo sapiens

<400> 3494

Leu Ala Val Val Lys Ser Ile Arg Ser Ile Pro Ala Tyr Leu
1 5 10

<210> 3495
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3495

Leu Asp Asp Pro Lys Tyr Ser Ser Asp Glu Asp Leu Pro Ser Lys
1 5 10 15

<210> 3496
<211> 15
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<400> 3496

Leu Asp Phe Leu Lys Ala Val Asp Thr Asn Arg Ala Ser Val Gly
1 5 10 15

<210> 3497
<211> 12
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<400> 3497

Leu Gly Glu Phe Val Ser Glu Thr Glu Ser Arg Gly
1 5 10

<210> 3498
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<212> PRT
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<400> 3498

Leu Gly Gln His Leu Leu Pro Trp Met Asp Arg Leu Ser Leu Glu
1 5 10 15

<210> 3499
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<212> PRT
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<400> 3499

Leu Ile Asn Glu Tyr Trp Val Leu Thr Ala Ala His Val Val Glu
1 5 10 15

<210> 3500
<211> 17
<212> PRT
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<400> 3500

Leu Lys Gln Glu Tyr Phe Val Val Ala Ala Thr Leu Gln Asp Ile Ile
1 5 10 15

Arg

<210> 3501
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3501

Leu Lys Thr Gly Lys Leu Val Ser Leu Ser Ala Gln Asn Leu Val Asp
1 5 10 15

Cys

<210> 3502
<211> 16
<212> PRT
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<400> 3502

Leu Met His Pro Asp Ala Leu Glu Glu Pro Asp Asp Gln Asn Arg Ile
1 5 10 15

<210> 3503
<211> 16
<212> PRT
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<400> 3503

Leu Asn Gln Glu Leu Arg Ala Asp Gly Thr Val Asn Gln Ile Glu Gly
1 5 10 15

<210> 3504
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3504

Leu Pro Gln Pro Asp Leu Arg Tyr Leu Phe Leu Asn Gly Asn Lys Leu
1 5 10 15

Ala Arg

<210> 3505
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3505

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

1 5 10 15

Pro

<210> 3506
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3506

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

<210> 3507
<211> 14
<212> PRT
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<400> 3507

Leu Val Ala Tyr Tyr Thr Leu Ile Gly Ala Ser Gly Gln Arg
1 5 10

<210> 3508
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3508

Met Gln Gln Lys Leu Val Asp Gln Asn Ile Phe Ser Phe
1 5 10

<210> 3509
<211> 13
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<400> 3509

Met Val Lys Val Leu Asp Ala Val Arg Gly Ser Pro Ala
1 5 10

<210> 3510
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3510

Asn Asp Val Lys Asn Val Ile Ile Trp Gly Asn His Ser Ser Thr Gln
1 5 10 15

<210> 3511

<211> 16
<212> PRT
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<400> 3511

Asn Glu Glu Glu Ile Arg Ala Asn Val Ala Val Val Ser Gly Ala Pro
1 5 10 15

<210> 3512
<211> 23
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<400> 3512

Asn Leu Asp Phe Leu Lys Ala Val Asp Thr Asn Arg Ala Ser Val Gly
1 5 10 15

Gln Asp Ser Pro Glu Pro Arg
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<210> 3513
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<212> PRT
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<400> 3513

Asn Pro Ala Glu Phe Val Val Asn Thr Ser Asn Ala Gly Ala Gly
1 5 10 15

<210> 3514
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3514

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

<210> 3515
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3515

Asn Pro Gly Thr Phe Arg Ile Leu Val Gly Asn Lys Gly Cys Ser His
1 5 10 15

Pro Ser

<210> 3516

<211> 17
<212> PRT
<213> Homo sapiens

<400> 3516

Asn Pro Leu Glu Ile Val Ser Ile Pro Asp Asn His Gly His Ile Asp
1 5 10 15

Pro

<210> 3517
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3517

Asn Ser Asn Gln Ile Lys Ile Leu Gly Asn Gln Gly Ser Phe Leu
1 5 10 15

<210> 3518
<211> 16
<212> PRT
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<400> 3518

Asn Val Pro Thr Ile Asp Ile His Met Asn Gln Ile Gly Phe Glu Arg
1 5 10 15

<210> 3519
<211> 16
<212> PRT
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<400> 3519

Gln Gly Gly Thr Tyr Ser Lys Ala Ser Thr Pro Asn Gly Tyr Asp Asn
1 5 10 15

<210> 3520
<211> 16
<212> PRT
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<400> 3520

Gln Pro Leu Gly Met Ile Ser Leu Met Lys Arg Pro Pro Gly Phe Ser
1 5 10 15

<210> 3521
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<400> 3521

Gln Ser Gly Glu Tyr Trp Ile Asp Pro Asn Gln Gly Ser Val Glu
1 5 10 15

<210> 3522
<211> 25
<212> PRT
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<400> 3522

Gln Ser Leu Pro His Glu Asn Lys Pro Leu Thr Leu Ser Asn Tyr Gln
1 5 10 15

Thr Asn Lys Ala Lys His Asp Glu Leu
20 25

<210> 3523
<211> 19
<212> PRT
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<400> 3523

Gln Thr Val Ala Val Gly Val Ile Lys Ala Val Asp Lys Lys Ala Ala
1 5 10 15

Gly Ala Gly

<210> 3524
<211> 13
<212> PRT
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<400> 3524

Arg Ile Glu Gly Ser Asn Lys Val Pro Val Asp Pro Ala
1 5 10

<210> 3525
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3525

Arg Leu Pro Gly Leu Ala Lys Gln Pro Ser Phe Arg Gln Tyr Ser Gly
1 5 10 15

<210> 3526
<211> 16
<212> PRT
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<400> 3526

Arg Pro Leu Leu Asp Lys Trp Pro Thr Thr Leu Ser Arg His Leu Gly
1 5 10 15

<210> 3527
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3527

Arg Pro Arg Ala Pro Ile Ile Ala Val Thr Arg Asn Pro Gln Thr Ala
1 5 10 15

<210> 3528
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3528

Ser Ala Arg Leu Thr Trp Asp Pro Thr Ser Arg Gln Ile Asn Gly
1 5 10 15

<210> 3529
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3529

Ser Asp Thr Ser Tyr Val Ser Leu Lys Ala Pro Leu Thr Lys Pro Leu
1 5 10 15

<210> 3530
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3530

Ser Asp Val Asp Leu Ile Pro Met Asn Asp His Asn Ala Tyr Arg
1 5 10 15

<210> 3531
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3531

Ser Phe Tyr Leu Ser Arg Asp Pro Asp Ala Gln Pro Gly
1 5 10

<210> 3532
<211> 16

<212> PRT
<213> Homo sapiens

<400> 3532

Ser Gly Asp Val Phe Thr Ala Leu Ile Gly Glu Ile Ala Ser Pro Asn
1 5 10 15

<210> 3533
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3533

Ser Gly Lys Pro Gln Tyr Met Val Leu Val Pro Ser Leu Leu His Thr
1 5 10 15

Glu Thr

<210> 3534
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3534

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

Thr Ala

<210> 3535
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3535

Ser Lys Asn Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp
1 5 10 15

Thr

<210> 3536
<211> 19
<212> PRT
<213> Homo sapiens

<400> 3536

Ser Leu Arg Pro Lys Asp Tyr Glu Val Asp Ala Thr Leu Lys Ser Leu
1 5 10 15

Asn Asn Gln

<210> 3537
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3537

Ser Pro Asp Arg Ile Phe Phe His Leu Asn Ala Val Ala Leu Gly Asp
1 5 10 15

Gly

<210> 3538
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3538

Ser Pro Glu Arg Pro Phe Leu Ala Ile Leu Gly Gly Ala Lys Val Ala
1 5 10 15

Asp Lys

<210> 3539
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3539

Ser Pro Leu Ser Val Ala Leu Ala Leu Ser His Leu Ala Leu Gly Ala
1 5 10 15

Gln

<210> 3540
<211> 14
<212> PRT
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<400> 3540

Ser Pro Met Tyr Ser Ile Ile Thr Pro Asn Ile Leu Arg Leu
1 5 10

<210> 3541

<211> 19
<212> PRT
<213> Homo sapiens

<400> 3541

Ser Pro Pro Ile Ser Tyr Ile Trp Tyr Lys Gln Gln Thr Asn Asn Gln
1 5 10 15

Glu Pro Ile

<210> 3542
<211> 19
<212> PRT
<213> Homo sapiens

<400> 3542

Ser Pro Val Thr Gly Tyr Arg Val Thr Thr Thr Pro Lys Asn Gly Pro
1 5 10 15

Gly Pro Thr

<210> 3543
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3543

Ser Arg Leu Pro Ile Ile Asp Val Ala Pro Leu Asp Val Gly Ala Pro
1 5 10 15

Asp

<210> 3544
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3544

Ser Tyr Ala Gly Lys Tyr Val Pro Ala Ile Ala His Leu Ile His Ser
1 5 10 15

<210> 3545
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3545

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

1 5 10 15

<210> 3546
<211> 21
<212> PRT
<213> Homo sapiens

<400> 3546

Thr Glu Glu Glu Phe Val Glu Gly Ile Tyr Lys Val Glu Ile Asp Thr
1 5 10 15

Lys Ser Tyr Trp Lys
20

<210> 3547
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3547

Thr Gly Ala Gln Glu Leu Leu Arg Val Leu Arg Ala Gln Pro Val Gln
1 5 10 15

Val Ala

<210> 3548
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3548

Thr Gly Asp Ala Tyr Val Ile Leu Lys Thr Val Gln Leu Arg Asn Gly
1 5 10 15

Asn Leu

<210> 3549
<211> 14
<212> PRT
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<400> 3549

Thr Gly Lys Leu Val Ser Leu Ser Ala Gln Asn Leu Val Asp
1 5 10

<210> 3550
<211> 15
<212> PRT
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<400> 3550

Thr Gly Lys Leu Val Ser Leu Ser Ala Gln Asn Leu Val Asp Cys
1 5 10 15

<210> 3551
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3551

Thr Gly Asn Tyr Arg Ile Glu Ser Val Leu Ser Ser Ser Gly Lys
1 5 10 15

<210> 3552
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3552

Thr His Met Leu Asp Val Met Gln Asp His Phe Ser Arg Ala Ser
1 5 10 15

<210> 3553
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3553

Thr Ile Tyr Val Ile Ala Leu Lys Asn Asn Gln Lys Ser Glu Pro Leu
1 5 10 15

<210> 3554
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3554

Thr Leu Asn Gln Ile Asp Glu Val Lys Val Trp Pro Gln Gln Pro Ser
1 5 10 15

<210> 3555
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3555

Thr Leu Gln Ser Phe Arg Gln Asp Val Asp Asn Ala Ser Leu Ala Arg
1 5 10 15

<210> 3556

<211> 17
<212> PRT
<213> Homo sapiens

<400> 3556

Thr Ser Ala Thr Asn Ile Val Lys Trp Ile Thr Lys Gln Gln Asn Ala
1 5 10 15

Gln

<210> 3557
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3557

Thr Thr Ala Phe Gln Tyr Ile Ile Asp Asn Lys Gly Ile Asp Ser
1 5 10 15

<210> 3558
<211> 19
<212> PRT
<213> Homo sapiens

<400> 3558

Val Ala Ile Gln Leu Asn Asp Thr His Pro Ser Leu Ala Ile Pro Glu
1 5 10 15

Leu Met Arg

<210> 3559
<211> 21
<212> PRT
<213> Homo sapiens

<400> 3559

Val Asp Asp Thr Gln Phe Val Arg Phe Asp Ser Asp Ala Ala Ser Pro
1 5 10 15

Arg Thr Glu Pro Arg
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<210> 3560
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3560

Val Asp Asp Thr Ser Ile Val Val Arg Trp Ser Arg Pro Gln Ala Pro

1 5 10 15

Ile Thr

<210> 3561
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3561

Val Asp Met Asp Phe Glu Val Glu Asn Ala Val Leu Gly Lys Asp Phe
1 5 10 15

Lys

<210> 3562
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3562

Val Phe Asn Ile Leu Arg Met Met Pro Lys Gly Ala Ala Leu His
1 5 10 15

<210> 3563
<211> 19
<212> PRT
<213> Homo sapiens

<400> 3563

Val Gly Pro Val Asp Glu Val Arg Glu Leu Gln Lys Ala Ile Gly Ala
1 5 10 15

Val Pro Leu

<210> 3564
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3564

Val His Pro Lys Val Thr Val Tyr Pro Ser Lys Thr Gln Pro Leu
1 5 10 15

<210> 3565
<211> 15
<212> PRT
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<400> 3565

Val Pro Pro Glu Trp Lys Ala Leu Thr Asp Met Pro Gln Met Arg
1 5 10 15

<210> 3566
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3566

Val Pro Val Pro Val Phe Cys Asp Met Thr Thr Glu Gly Gly Lys Trp
1 5 10 15

<210> 3567
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3567

Val Pro Val Pro Val Phe Cys Asp Met Thr Thr Glu Gly Gly Lys Trp
1 5 10 15

Thr

<210> 3568
<211> 14
<212> PRT
<213> Homo sapiens

<400> 3568

Val Pro Tyr Val Ile Val Pro Leu Lys Thr Gly Leu Gln Glu
1 5 10

<210> 3569
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3569

Val Ser Gly Thr Leu Val Leu Leu Gln Gly Ala Arg Gly Phe Ala
1 5 10 15

<210> 3570
<211> 15
<212> PRT
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<400> 3570

Val Ser Gln Tyr Phe Gln Thr Val Thr Asp Tyr Gly Lys Asp Leu

1 5 10 15

<210> 3571
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3571

Val Ser Thr Ala Phe Val Tyr Thr Lys Asn Pro Asn Gly Tyr Ser
1 5 10 15

<210> 3572
<211> 19
<212> PRT
<213> Homo sapiens

<400> 3572

Val Val Leu Pro Ser Tyr Glu Glu Ala Leu Ser Leu Pro Ser Lys Thr
1 5 10 15

Pro Glu Gly

<210> 3573
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3573

Val Val Tyr Tyr Arg Val Gln Asn Ala Thr Leu Ala Val Ala Asn
1 5 10 15

<210> 3574
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3574

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

Thr Ala

<210> 3575
<211> 19
<212> PRT
<213> Homo sapiens

<400> 3575

Tyr Asp Gly Ser His Arg Tyr Val Ile Leu Lys Ser Glu Pro Val His

1 5 10 15

Pro Phe Gly

<210> 3576
<211> 26
<212> PRT
<213> Homo sapiens

<400> 3576

Tyr Asp Leu Arg His Thr Phe Met Gly Val Val Ser Leu Gly Ser Pro
1 5 10 15

Ser Gly Glu Val Ser His Pro Arg Lys Thr
20 25

<210> 3577
<211> 12
<212> PRT
<213> Homo sapiens

<400> 3577

Tyr Leu Gln Met Asn Ser Leu Arg Val Glu Asp Thr
1 5 10

<210> 3578
<211> 12
<212> PRT
<213> Homo sapiens

<400> 3578

Tyr Leu Gln Met Asn Ser Val Arg Ala Glu Asp Thr
1 5 10

<210> 3579
<211> 11
<212> PRT
<213> Homo sapiens

<400> 3579

Tyr Val Asn Gly Leu Thr Leu Gly Gly Gln Lys
1 5 10

<210> 3580
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3580

Cys Asp Met Asn Thr Glu Asn Gly Gly Trp Thr Val Ile Gln Asn

1 5 10 15

<210> 3581
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3581

Asp Val Ser Ala Gln Met Glu Tyr Cys Arg Thr Pro Cys Thr Val
1 5 10 15

<210> 3582
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3582

Asp Trp Pro Phe Cys Ser Asp Glu Asp Trp Asn Tyr Lys Cys Pro
1 5 10 15

<210> 3583
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3583

Glu Ala Val Gln Ser Thr Ser Ser Ser Ser Gln Phe Tyr Met Tyr
1 5 10 15

<210> 3584
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3584

Phe Thr Asn Arg Ile Asn Lys Leu Lys Asn Ser Leu Phe Glu Tyr
1 5 10 15

<210> 3585
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3585

Gly Asp Lys Glu Leu Arg Thr Gly Lys Glu Lys Val Thr Ser Gly
1 5 10 15

<210> 3586
<211> 12
<212> PRT
<213> Mycobacterium tuberculosis

<400> 3586

Gly Leu Glu Pro Gly Val Val Ala Glu Lys Val Arg
1 5 10

<210> 3587
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3587

Gly Ser Ser Glu Arg Gly Ser Ala Gly His Trp Thr Ser Glu Ser
1 5 10 15

<210> 3588
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3588

Ile Arg Val Leu Arg Ser Ile Leu Glu Asn Leu Arg Ser Lys Ile
1 5 10 15

<210> 3589
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3589

Ile Thr Ser Asp Pro Arg Lys Gln Cys Ser Lys Glu Asp Gly Gly
1 5 10 15

<210> 3590
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3590

Leu Glu Asn Leu Arg Ser Lys Ile Gln Lys Leu Glu Ser Asp Val
1 5 10 15

<210> 3591
<211> 11
<212> PRT
<213> Mycobacterium tuberculosis

<400> 3591

Leu Glu Pro Gly Val Val Ala Glu Lys Val Arg
1 5 10

<210> 3592
<211> 15

<212> PRT
<213> Homo sapiens

<400> 3592

Leu Leu Gln Gln Glu Arg Pro Ile Arg Asn Ser Val Asp Glu Leu
1 5 10 15

<210> 3593
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3593

Leu Met Gly Glu Asn Arg Thr Met Thr Ile His Asn Gly Met Phe
1 5 10 15

<210> 3594
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3594

Asn Ser Asn Ile Pro Thr Asn Leu Arg Val Leu Arg Ser Ile Leu
1 5 10 15

<210> 3595
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3595

Pro Arg Lys Gln Cys Ser Lys Glu Asp Gly Gly Gly Trp Trp Tyr
1 5 10 15

<210> 3596
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3596

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

<210> 3597
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3597

Gln Lys Gln Leu Glu Gln Val Ile Ala Lys Asp Leu Leu Pro Ser
1 5 10 15

<210> 3598
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3598

Gln Met Glu Tyr Cys Arg Thr Pro Cys Thr Val Ser Cys Asn Ile
1 5 10 15

<210> 3599
<211> 15
<212> PRT
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<400> 3599

Gln Asn Pro Gly Ser Pro Arg Pro Gly Ser Thr Gly Thr Trp Asn
1 5 10 15

<210> 3600
<211> 15
<212> PRT
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<400> 3600

Ser Glu Thr Glu Ser Arg Gly Ser Glu Ser Gly Ile Phe Thr Asn
1 5 10 15

<210> 3601
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3601

Ser Gly Cys Arg Met Lys Gly Leu Ile Asp Glu Val Asn Gln Asp
1 5 10 15

<210> 3602
<211> 15
<212> PRT
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<400> 3602

Ser Gly Pro Gly Ser Thr Gly Asn Arg Asn Pro Gly Ser Ser Gly
1 5 10 15

<210> 3603
<211> 15
<212> PRT
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<400> 3603

Thr Pro Cys Thr Val Ser Cys Asn Ile Pro Val Val Ser Gly Lys
1 5 10 15

<210> 3604
<211> 15
<212> PRT
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<400> 3604

Thr Thr Arg Arg Ser Cys Ser Lys Thr Val Thr Lys Thr Val Ile
1 5 10 15

<210> 3605
<211> 15
<212> PRT
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<400> 3605

Thr Val Gln Asn Glu Ala Asn Lys Tyr Gln Ile Ser Val Asn Lys
1 5 10 15

<210> 3606
<211> 15
<212> PRT
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<400> 3606

Val Asp Ile Asp Ile Lys Ile Arg Ser Cys Arg Gly Ser Cys Ser
1 5 10 15

<210> 3607
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3607

Val Asp Ile Asp Ile Lys Ile Arg Ser Cys Arg Gly Ser Cys Ser
1 5 10 15

<210> 3608
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3608

Val Ser Pro Gly Thr Arg Arg Glu Tyr His Thr Glu Lys Leu Val
1 5 10 15

<210> 3609
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3609

Val Val Trp Met Asn Trp Lys Gly Ser Trp Tyr Ser Met Arg Lys
1 5 10 15

<210> 3610
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3610

Trp Tyr Asn Arg Cys His Ala Ala Asn Pro Asn Gly Arg Tyr Tyr
1 5 10 15

<210> 3611
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3611

Trp Tyr Ser Met Arg Lys Met Ser Met Lys Ile Arg Pro Phe Phe
1 5 10 15

<210> 3612
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3612

Tyr Cys Gly Leu Pro Gly Glu Tyr Trp Leu Gly Asn Asp Lys Ile
1 5 10 15

<210> 3613
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3613

Asn Glu Glu Gly Phe Phe Ser Ala Arg Gly His Arg Pro Leu Asp Lys
1 5 10 15

Lys

<210> 3614
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3614

Gly Pro Arg Val Val Glu Arg His Gln Ser Ala Cys Lys Asp Ser

1 5 10 15

<210> 3615
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3615

Lys Ile His Ala Arg Glu Ile Phe Asp Ser Arg Gly Asn Pro Thr Val
1 5 10 15

Glu

<210> 3616
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3616

Val Tyr Ala Thr Arg Ser Ser Ala Val Arg Leu Arg Ser Ser Val
1 5 10 15

<210> 3617
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3617

Gly Val Tyr Ala Thr Arg Ser Ser Ala Val Arg Leu Arg Ser Ser Val
1 5 10 15

Pro Gly Val Arg
20

<210> 3618
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3618

Gly Val Tyr Ala Thr Arg Ser Ser Ala Val Arg Leu Arg Ser Ser Val
1 5 10 15

Pro Gly Val Arg
20

<210> 3619
<211> 5
<212> PRT
<213> Homo sapiens

<400> 3619

Gly Tyr Arg Ala Arg
1 5

<210> 3620
<211> 4
<212> PRT
<213> Homo sapiens

<400> 3620

Arg Val Val Glu
1

<210> 3621
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3621

Ser Gly Ile Gly Thr Leu Asp Gly Phe Arg His Arg His Pro Asp
1 5 10 15

<210> 3622
<211> 5
<212> PRT
<213> Homo sapiens

<400> 3622

Val Glu Arg His Gln
1 5

<210> 3623
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3623

Ala Ala Ala Ile Ala Tyr Gly Leu Asp Lys Arg Glu Gly Glu Lys Asn
1 5 10 15

Ile Leu Val Phe
20

<210> 3624
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3624

Ala Gly Thr Ile Ala Gly Leu Asn Val Met Arg Ile Ile Asn Glu Pro

1 5 10 15

Thr Ala Ala Ala
20

<210> 3625
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3625

Ala Lys Phe Glu Glu Leu Asn Met Asp Leu Phe Arg Ser Thr Met Lys
1 5 10 15

Pro Val Gln Lys
20

<210> 3626
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3626

Ala Lys Arg Ala Leu Ser Ser Gln His Gln Ala Arg Ile Glu Ile Glu
1 5 10 15

Ser Phe Tyr Glu
20

<210> 3627
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3627

Ala Lys Arg Ala Leu Ser Ser Gln His Gln Ala Arg Ile Glu Ile Glu
1 5 10 15

Ser Phe Tyr Glu
20

<210> 3628
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3628

Ala Thr Asn Gly Asp Thr His Leu Gly Gly Glu Asp Phe Asp Gln Arg
1 5 10 15

Val Met Glu His
20

<210> 3629
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3629

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

Thr Thr Tyr Ser
20

<210> 3630
<211> 21
<212> PRT
<213> Homo sapiens

<400> 3630

Glu Asp Lys Lys Leu Lys Glu Arg Ile Asp Thr Arg Asn Glu Leu Glu
1 5 10 15

Ser Tyr Ala Tyr Ser
20

<210> 3631
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3631

Glu Ser His Gln Asp Ala Asp Ile Glu Asp Phe Lys Ala Lys Lys Lys
1 5 10 15

Glu Leu Glu Glu
20

<210> 3632
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3632

Phe Ala Glu Glu Asp Lys Lys Leu Lys Glu Arg Ile Asp Thr Arg Asn
1 5 10 15

Glu Leu Glu Ser
20

<210> 3633
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3633

Gly Ser Ala Gly Pro Pro Pro Thr Gly Glu Glu Asp Thr Ala Glu Leu
1 5 10 15

His His His His
20

<210> 3634
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3634

Ile Asp Glu Ile Val Leu Val Gly Gly Ser Thr Arg Ile Pro Lys Ile
1 5 10 15

Gln Gln Leu Val
20

<210> 3635
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3635

Lys Asp Asn Arg Ala Val Gln Lys Leu Arg Arg Glu Val Glu Lys Ala
1 5 10 15

Lys Arg Ala Leu
20

<210> 3636
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3636

Lys Glu Thr Met Glu Lys Ala Val Glu Glu Lys Ile Glu Trp Leu Glu
1 5 10 15

Ser His Gln Asp
20

<210> 3637
<211> 16

<212> PRT
<213> Homo sapiens

<400> 3637

Lys Ile His Ala Arg Glu Ile Phe Asp Ser Arg Gly Asn Pro Thr Val
1 5 10 15

<210> 3638
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3638

Lys Leu Arg Arg Glu Val Glu Lys Ala Lys Arg Ala Leu Ser Ser Gln
1 5 10 15

His Gln Ala Arg
20

<210> 3639
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3639

Lys Thr Gly Lys Asp Val Arg Lys Asp Asn Arg Ala Val Gln Lys Leu
1 5 10 15

Arg Arg Glu Val
20

<210> 3640
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3640

Lys Thr Gly Lys Asp Val Arg Lys Asp Asn Arg Ala Val Gln Lys Leu
1 5 10 15

Arg Arg Glu Val
20

<210> 3641
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3641

Leu Tyr Lys Lys Lys Thr Gly Lys Asp Val Arg Lys Asp Asn Arg Ala
1 5 10 15

Val Gln Lys Leu
            20

<210> 3642
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3642

Asn Lys Ile Thr Ile Thr Asn Asp Gln Asn Arg Leu Thr Pro Glu Glu
1   5   10   15

Ile Glu Arg Met
            20

<210> 3643
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3643

Asn Pro Glu Asn Thr Val Phe Asp Ala Lys Arg Leu Ile Gly Arg Thr
1   5   10   15

Trp Asn Asp Pro
            20

<210> 3644
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3644

Gln Asn Arg Leu Thr Pro Glu Glu Ile Glu Arg Met Val Asn Asp Ala
1   5   10   15

Glu Lys Phe Ala
            20

<210> 3645
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3645

Arg Lys Asp Asn Arg Ala Val Gln Lys Leu Arg Arg Glu Val Glu Lys
1   5   10   15

Ala Lys Arg Ala

20

<210> 3646
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3646

Arg Lys Asp Asn Arg Ala Val Gln Lys Leu Arg Arg Glu Val Glu Lys
1 5 10 15

Ala Lys Arg Ala
20

<210> 3647
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3647

Ser Tyr Val Ala Phe Thr Pro Glu Gly Glu Arg Leu Ile Gly Asp Ala
1 5 10 15

Ala Lys Asn Gln
20

<210> 3648
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3648

Thr Phe Glu Ile Asp Val Asn Gly Ile Leu Arg Val Thr Ala Glu Asp
1 5 10 15

Lys Gly Thr Gly
20

<210> 3649
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3649

Thr Phe Glu Ile Asp Val Asn Gly Ile Leu Arg Val Thr Ala Glu Asp
1 5 10 15

Lys Gly Thr Gly
20

<210> 3650
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3650

Thr Val Gly Gly Val Met Thr Lys Leu Ile Pro Arg Asn Thr Val Val
1 5 10 15

Pro Thr Lys Lys
20

<210> 3651
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3651

Thr Val Pro Ala Tyr Phe Asn Asp Ala Gln Arg Gln Ala Thr Lys Asp
1 5 10 15

Ala Gly Thr Ile
20

<210> 3652
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3652

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

Asn His Leu Leu
20

<210> 3653
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3653

Val Glu Ile Ile Ala Asn Asp Gln Gly Asn Arg Ile Thr Pro Ser Tyr
1 5 10 15

Val Ala Phe Thr
20

<210> 3654
<211> 20
<212> PRT

<213> Homo sapiens

<400> 3654

Val Lys Glu Phe Phe Asn Gly Lys Glu Pro Ser Arg Gly Ile Asn Pro
1 5 10 15

Asp Glu Ala Val
20

<210> 3655
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3655

Tyr Glu Gly Glu Asp Phe Ser Glu Thr Leu Thr Arg Ala Lys Phe Glu
1 5 10 15

Glu Leu Asn Met
20

<210> 3656
<211> 327
<212> PRT
<213> Homo sapiens

<400> 3656

Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Cys Ser Arg
1 5 10 15

Ser Thr Ser Glu Ser Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr
20 25 30

Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser
35 40 45

Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser
50 55 60

Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu Gly Thr Lys Thr
65 70 75 80

Tyr Thr Cys Asn Val Asp His Lys Pro Ser Asn Thr Lys Val Asp Lys
85 90 95

Arg Val Glu Ser Lys Tyr Gly Pro Pro Cys Pro Ser Cys Pro Ala Pro
100 105 110

Glu Phe Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys

115 120 125

Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val
130 135 140

Asp Val Ser Gln Glu Asp Pro Glu Val Gln Phe Asn Trp Tyr Val Asp
145 150 155 160

Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Phe
165 170 175

Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp
180 185 190

Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Gly Leu
195 200 205

Pro Ser Ser Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg
210 215 220

Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Gln Glu Glu Met Thr Lys
225 230 235 240

Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp
245 250 255

Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys
260 265 270

Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser
275 280 285

Arg Leu Thr Val Asp Lys Ser Arg Trp Gln Glu Gly Asn Val Phe Ser
290 295 300

Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser
305 310 315 320

Leu Ser Leu Ser Leu Gly Lys
325

<210> 3657
<211> 15
<212> PRT
<213> Rattus norvegicus

<400> 3657

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

1 5 10 15

<210> 3658
<211> 15
<212> PRT
<213> Rattus norvegicus

<400> 3658

Gly Ile Ala Gly Phe Lys Gly Glu Gln Gly Pro Lys Gly Glu Thr
1 5 10 15

<210> 3659
<211> 15
<212> PRT
<213> Rattus norvegicus

<400> 3659

Gly Ile Ala Gly Phe Lys Gly Glu Gln Gly Pro Lys Gly Glu Thr
1 5 10 15

<210> 3660
<211> 15
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3660

Gly Ile Ala Gly Asn Lys Gly Asp Gln Gly Pro Lys Gly Glu Asx
1 5 10 15

<210> 3661
<211> 20
<212> PRT
<213> Mycobacterium tuberculosis

<400> 3661

Thr Leu Val Val Asn Lys Ile Arg Gly Thr Phe Lys Ser Val Ala Val
1 5 10 15

Lys Ala Pro Gly
20

<210> 3662
<211> 20
<212> PRT
<213> Chlamydia pneumoniae

<400> 3662

Thr Leu Val Val Asn Lys Leu Gln Gly Leu Leu Gln Val Thr Val Val
1 5 10 15

Thr Ile Pro Gln
            20

<210> 3663
<211> 14
<212> PRT
<213> Homo sapiens

<400> 3663

Leu Thr Val Gly Leu Thr Arg Arg Gly Gln Pro Arg Gln Tyr
1   5   10

<210> 3664
<211> 14
<212> PRT
<213> Homo sapiens

<400> 3664

Leu Thr Val Gly Leu Thr Arg Arg Gly Gln Pro Arg Gln Tyr
1   5   10

<210> 3665
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3665

Tyr Asn Gln Tyr Ser Gln Arg Tyr His Gln Arg Thr Asn
1   5   10

<210> 3666
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3666

Ala Pro Ala Pro Thr Ala Arg Asn Lys Leu Thr Ser Glu
1   5   10

<210> 3667
<211> 21
<212> PRT
<213> Homo sapiens

<400> 3667

Asp Ala Pro Arg Ala Val Phe Pro Ser Ile Val Gly Arg Pro Arg His
1   5   10   15

Gln Gly Val Met Val
            20

<210> 3668
<211> 12
<212> PRT
<213> Homo sapiens

<400> 3668

Glu Ala Gln Ser Lys Arg Gly Ile Leu Thr Leu Lys
1 5 10

<210> 3669
<211> 11
<212> PRT
<213> Homo sapiens

<400> 3669

Glu Arg Leu Gly Pro Leu Val Glu Gln Gly Arg
1 5 10

<210> 3670
<211> 10
<212> PRT
<213> Homo sapiens

<400> 3670

Gly Pro Ser Ile Val His Arg Lys Cys Phe
1 5 10

<210> 3671
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3671

Ile Trp His His Thr Phe Tyr Asn Glu Leu Arg Val Ala Pro Glu Glu
1 5 10 15

<210> 3672
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3672

Lys Leu Thr Ser Glu Ala Arg Gly Arg Ile Pro Val Ala Gln Lys
1 5 10 15

<210> 3673
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3673

Leu Ala Val Tyr Gln Ala Gly Ala Arg Glu Gly Ala Glu Arg Gly Leu
1 5 10 15

Ser Ala Ile Arg
20

<210> 3674
<211> 14
<212> PRT
<213> Homo sapiens

<400> 3674

Leu Asp Leu Ala Gly Arg Asp Leu Thr Asp Tyr Leu Met Lys
1 5 10

<210> 3675
<211> 27
<212> PRT
<213> Homo sapiens

<400> 3675

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

Arg Glu Ile Val Arg Asp Ile Lys Glu Lys Leu
20 25

<210> 3676
<211> 11
<212> PRT
<213> Homo sapiens

<400> 3676

Pro Gly Ile Ala Asp Arg Met Gln Lys Glu Ile
1 5 10

<210> 3677
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3677

Arg Gln Val Asp Ala Arg Arg Asn Val Pro Gln Asn Asp
1 5 10

<210> 3678
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3678

Gln Tyr Met Arg Ala Asp Gln Ala Ala Gly Gly Leu Arg
1 5 10

<210> 3679
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3679

Ser Ala Val Arg Ala Arg Ser Ser Val Pro Gly Val Arg
1 5 10

<210> 3680
<211> 19
<212> PRT
<213> Homo sapiens

<400> 3680

Ala Leu Met Arg Gly Lys Ser Thr Glu Glu Ala Arg Lys Glu Leu Gln
1 5 10 15

Ala Ala Gly

<210> 3681
<211> 19
<212> PRT
<213> Homo sapiens

<400> 3681

Ala Met Leu Pro Tyr Asp Gln Tyr Leu His Arg Phe Ala Ala Tyr Phe
1 5 10 15

Gln Gln Gly

<210> 3682
<211> 19
<212> PRT
<213> Homo sapiens

<400> 3682

Ala Ser Thr Asn Gly Leu Ile Asn Phe Ile Lys Gln Gln Arg Glu Ala
1 5 10 15

Arg Val Gln

<210> 3683
<211> 19

<212> PRT
<213> Homo sapiens

<400> 3683

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

Asn Gly Glu

<210> 3684
<211> 19
<212> PRT
<213> Homo sapiens

<400> 3684

Glu Asp Leu Glu Arg Leu Leu Pro His Lys Val Phe Glu Gly Asn Arg
1 5 10 15

Pro Thr Asn

<210> 3685
<211> 19
<212> PRT
<213> Homo sapiens

<400> 3685

Phe Glu Phe Trp Asp Trp Val Gly Gly Arg Tyr Ser Leu Trp Ser Ala
1 5 10 15

Ile Gly Leu

<210> 3686
<211> 19
<212> PRT
<213> Homo sapiens

<400> 3686

Lys Leu Gln Gln Trp Tyr Arg Glu His Arg Ser Glu Leu Asn Leu Arg
1 5 10 15

Arg Leu Phe

<210> 3687
<211> 19
<212> PRT
<213> Homo sapiens

<400> 3687

Asn Tyr Thr Glu Gly Arg Ala Val Leu His Val Ala Leu Arg Asn Arg
1 5 10 15

Ser Asn Thr

<210> 3688
<211> 19
<212> PRT
<213> Homo sapiens

<400> 3688

Ser Phe Cys Gln Arg Val Arg Ser Gly Asp Trp Lys Gly Tyr Thr Gly
1 5 10 15

Lys Thr Ile

<210> 3689
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3689

Val Tyr Ala Thr Arg Ser Ser Ala Val Arg Leu Arg Ser Ser Val Pro
1 5 10 15

<210> 3690
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3690

Asn Glu Glu Gly Phe Phe Ser Ala Arg Gly His Arg Pro Leu Asp Lys
1 5 10 15

Lys

<210> 3691
<211> 19
<212> PRT
<213> Homo sapiens

<400> 3691

Ser His Gln Glu Ser Thr Arg Gly Arg Ser Arg Gly Arg Ser Gly Arg
1 5 10 15

Ser Gly Ser

<210> 3692
<211> 5
<212> PRT
<213> Homo sapiens

<400> 3692

Thr Arg Gly Arg Ser
1 5

<210> 3693
<211> 36
<212> PRT
<213> Unknown

<220>
<223> epitope involved in rheumatoid arthritis

<400> 3693

His Ser Thr Lys Arg Gly His Ala Lys Ser Arg Pro Val Arg Gly His
1 5 10 15

Gln Ser His Gln Glu Ser Thr Arg Gly Arg Ser Arg Gly Arg Ser Gly
20 25 30

Arg Ser Gly Ser
35

<210> 3694
<211> 15
<212> PRT
<213> Trypanosoma cruzi

<400> 3694

Ala Glu Glu Glu Glu Asp Asp Asp Met Gly Phe Gly Leu Phe Asp
1 5 10 15

<210> 3695
<211> 32
<212> PRT
<213> Trypanosoma cruzi

<400> 3695

Ala Ser Ala Pro Thr Ala Ala Ala Ala Ala Ser Gly Gly Ala Ala Ala
1 5 10 15

Pro Ala Ala Ala Ala Glu Glu Glu Glu Asp Asp Asp Met Gly Phe Gly
20 25 30

<210> 3696

<211> 35
<212> PRT
<213> Trypanosoma cruzi

<400> 3696

Ala Ser Ala Pro Thr Ala Ala Ala Ala Ala Ser Gly Gly Ala Ala Ala
1 5 10 15

Pro Ala Ala Ala Ala Glu Glu Glu Glu Asp Asp Asp Met Gly Phe Gly
20 25 30

Leu Phe Asp
35

<210> 3697
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3697

Cys Ala Pro Glu Ser Ile Glu Phe Pro Val Ser Glu Ala Arg Val Leu
1 5 10 15

Glu Asp

<210> 3698
<211> 10
<212> PRT
<213> Homo sapiens

<400> 3698

Asp Asp Asp Met Gly Phe Gly Leu Phe Asp
1 5 10

<210> 3699
<211> 16
<212> PRT
<213> Mycobacterium tuberculosis

<400> 3699

Asp Leu Ser Leu Leu Gly Lys Ala Arg Lys Val Val Val Thr Lys Asp
1 5 10 15

<210> 3700
<211> 13
<212> PRT
<213> Trypanosoma cruzi

<400> 3700

Glu Glu Glu Asp Asp Asp Met Gly Phe Gly Leu Phe Asp

1 5 10

<210> 3701
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3701

Glu Glu Ser Asp Asp Asp Met Gly Phe Gly Leu Phe Asp
1 5 10

<210> 3702
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3702

Glu Asn Pro Val Val His Phe Phe Lys Asn Ile Val Thr Pro Arg Thr
1 5 10 15

Pro

<210> 3703
<211> 5
<212> PRT
<213> Homo sapiens

<400> 3703

Glu Arg Lys Arg Arg
1 5

<210> 3704
<211> 12
<212> PRT
<213> Mus musculus

<400> 3704

Phe Tyr Asn Gln Lys Phe Lys Gly Lys Ala Thr Leu
1 5 10

<210> 3705
<211> 15
<212> PRT
<213> Human herpesvirus

<400> 3705

Gly Asp Asp Gly Asp Asp Gly Asp Glu Gly Gly Asp Gly Asp Glu
1 5 10 15

<210> 3706

<211> 24
<212> PRT
<213> Human herpesvirus

<400> 3706

Gly Gly Asp Asn His Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly
1 5 10 15

Gly Gly Arg Pro Gly Ala Pro Gly
20

<210> 3707
<211> 9
<212> PRT
<213> Human herpesvirus

<400> 3707

Gly Leu Cys Thr Leu Val Ala Met Leu
1 5

<210> 3708
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3708

Gly Pro Ser Gln Gln Val Met Thr Pro Gln Gly Arg Gly Thr Val Ala
1 5 10 15

Ala Ala

<210> 3709
<211> 10
<212> PRT
<213> Homo sapiens

<400> 3709

His Leu Lys Ala Val Lys Met Thr Leu Lys
1 5 10

<210> 3710
<211> 9
<212> PRT
<213> Homo sapiens

<400> 3710

Ile Leu Gln Asp Gly Arg Ile Phe Ile
1 5

<210> 3711

<211> 22
<212> PRT
<213> Artemia franciscana

<400> 3711

Lys Lys Glu Glu Lys Lys Glu Glu Ser Glu Glu Glu Asp Glu Asp Met
1 5 10 15

Gly Phe Gly Leu Phe Asp
20

<210> 3712
<211> 24
<212> PRT
<213> Mus musculus

<400> 3712

Lys Arg His Arg Lys Val Leu Arg Asp Asn Ile Gln Gly Ile Thr Lys
1 5 10 15

Pro Ala Ile Arg Arg Leu Ala Arg
20

<210> 3713
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3713

Lys Arg Val Leu Gly Leu Val Leu Leu Arg Gly Glu Asn Leu Val Ser
1 5 10 15

Met

<210> 3714
<211> 7
<212> PRT
<213> Trypanosoma cruzi

<400> 3714

Met Gly Phe Gly Leu Phe Asp
1 5

<210> 3715
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3715

Pro Thr Arg Ala Glu Thr Arg Glu Glu Arg Met Glu Arg Lys Arg Arg

1 5 10 15

Glu Lys Ile Glu
20

<210> 3716
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3716

Gln Pro His Asp Leu Gly Lys Val Gly Glu Val Ile Val Thr Lys Asp
1 5 10 15

<210> 3717
<211> 9
<212> PRT
<213> Homo sapiens

<400> 3717

Ser Ile Arg Gly Asn Asn Ile Arg Tyr
1 5

<210> 3718
<211> 24
<212> PRT
<213> Mus musculus

<400> 3718

Thr Tyr Thr Glu His Ala Lys Arg Lys Thr Val Thr Ala Met Asp Val
1 5 10 15

Val Tyr Ala Leu Lys Arg Gln Gly
20

<210> 3719
<211> 13
<212> PRT
<213> Human herpesvirus

<400> 3719

Arg Gly Gln Gly Asp Gly Gly Arg Arg Lys Lys Gly Gly
1 5 10

<210> 3720
<211> 21
<212> PRT
<213> Mus musculus

<400> 3720

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

1 5 10 15

Pro Lys Arg Ala Val
20

<210> 3721
<211> 22
<212> PRT
<213> Mus musculus

<400> 3721

Ala Glu Val Arg Lys Ala Leu Ser Arg Gln Glu Met Gln Glu Val Gln
1 5 10 15

Ser Ser Arg Ser Gly Arg
20

<210> 3722
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3722

Cys Lys Pro Ile Ser Gly His Asn Ser Leu Phe Trp Tyr Arg Gln Thr
1 5 10 15

<210> 3723
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3723

Asp Ala Gly Val Ile Gln Ser Pro Arg His Glu Val Thr Glu Met Gly
1 5 10 15

<210> 3724
<211> 21
<212> PRT
<213> Mus musculus

<400> 3724

Asp Lys Ile Val Leu Gln Lys Tyr His Thr Ile Asn Gly His Asn Ala
1 5 10 15

Glu Val Arg Lys Ala
20

<210> 3725
<211> 10
<212> PRT
<213> Homo sapiens

<400> 3725

Asp Pro Ile Ser Gly His Val Ser Leu Phe
1 5 10

<210> 3726
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3726

Lys Ile Gln Pro Ser Glu Pro Arg Asp Ser Ala Val Tyr Phe Cys Ala
1 5 10 15

<210> 3727
<211> 10
<212> PRT
<213> Homo sapiens

<400> 3727

Lys Pro Ile Ser Gly His Asn Ser Leu Phe
1 5 10

<210> 3728
<211> 21
<212> PRT
<213> Mus musculus

<400> 3728

Leu Thr Asp Cys Val Val Met Arg Asp Pro Ala Ser Lys Arg Ser Arg
1 5 10 15

Gly Phe Gly Phe Val
20

<210> 3729
<211> 21
<212> PRT
<213> Mus musculus

<400> 3729

Met Glu Arg Glu Lys Glu Gln Phe Arg Lys Leu Phe Ile Gly Gly Leu
1 5 10 15

Ser Phe Glu Thr Thr
20

<210> 3730
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3730

Gln Pro Leu Lys Glu Gln Pro Ala Leu Asn Asp Ser Arg Tyr Cys Leu
1 5 10 15

<210> 3731
<211> 21
<212> PRT
<213> Mus musculus

<400> 3731

Arg Gly Phe Gly Phe Val Thr Phe Ser Ser Met Ala Glu Val Asp Ala
1 5 10 15

Ala Met Ala Ala Arg
20

<210> 3732
<211> 11
<212> PRT
<213> Homo sapiens

<400> 3732

Arg Ser Leu Asp Phe Gln Ala Thr Thr Met Phe
1 5 10

<210> 3733
<211> 27
<212> PRT
<213> Mus musculus

<400> 3733

Ser Gly Lys Pro Gly Ala His Val Thr Val Lys Lys Leu Phe Val Gly
1 5 10 15

Gly Ile Lys Glu Asp Thr Glu Glu His His Leu
20 25

<210> 3734
<211> 10
<212> PRT
<213> Homo sapiens

<400> 3734

Ser Pro Arg Ser Gly Asp Leu Ser Val Tyr
1 5 10

<210> 3735
<211> 25
<212> PRT
<213> Homo sapiens

<400> 3735

Ala Gln Gly Thr Leu Ser Lys Ile Phe Lys Leu Gly Gly Arg Asp Ser
1 5 10 15

Arg Ser Gly Ser Pro Met Ala Arg Arg
20 25

<210> 3736
<211> 19
<212> PRT
<213> Mus musculus

<400> 3736

Leu Ser Arg Phe Ser Trp Gly Ala Glu Gly Gln Lys Pro Gly Phe Gly
1 5 10 15

Tyr Gly Gly

<210> 3737
<211> 21
<212> PRT
<213> Mus musculus

<400> 3737

Met Glu Val Gly Trp Tyr Arg Ser Pro Phe Ser Arg Val Val His Leu
1 5 10 15

Tyr Arg Asn Gly Lys
20

<210> 3738
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3738

Lys Glu Gln Phe Leu Asp Gly Asp Gly Trp Thr Ser Arg Trp Ile Glu
1 5 10 15

Ser Lys

<210> 3739
<211> 21
<212> PRT
<213> Homo sapiens

<400> 3739

Arg Ile His Met Val Tyr Ser Lys Arg Ser Gly Lys Pro Arg Gly Tyr
1 5 10 15

Ala Phe Ile Glu Tyr
20

<210> 3740
<211> 10
<212> PRT
<213> Homo sapiens

<400> 3740

Tyr Thr Cys Pro Leu Cys Arg Ala Pro Val
1 5 10

<210> 3741
<211> 10
<212> PRT
<213> Homo sapiens

<400> 3741

Asp Trp Glu Tyr Ser Val Trp Leu Ser Asn
1 5 10

<210> 3742
<211> 19
<212> PRT
<213> Homo sapiens

<400> 3742

Gly Tyr Tyr Trp Ser Trp Ile Arg Gln Pro Pro Gly Lys Gly Glu Glu
1 5 10 15

Trp Ile Gly

<210> 3743
<211> 9
<212> PRT
<213> Homo sapiens

<400> 3743

Lys Gly Glu Gln Gly Glu Pro Gly Ala
1 5

<210> 3744
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3744

Val Thr Trp Glu Val Leu Glu Gly Glu Val Glu Lys Glu Ala Leu Lys
1 5 10 15

Lys Ile

<210> 3745
<211> 26
<212> PRT
<213> Homo sapiens

<400> 3745

Ala Gly Ala Ala Arg Asp Ala Leu Gln Gly Phe Lys Ile Thr Gln Asn
1 5 10 15

Asn Ala Met Lys Ile Ser Phe Ala Lys Lys
20 25

<210> 3746
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3746

Ala Asn Asn Gly Asn Leu Gln Leu Arg Asn Lys Glu Val Thr Trp Glu
1 5 10 15

Val Leu Glu Gly
20

<210> 3747
<211> 21
<212> PRT
<213> Homo sapiens

<400> 3747

Asp Gly Tyr Val Trp Gln Val Thr Asp Met Asn Arg Leu His Arg Phe
1 5 10 15

Leu Cys Phe Gly Ser
20

<210> 3748
<211> 15
<212> PRT
<213> Bos taurus

<400> 3748

Asp Val Val Tyr Ala Leu Lys Arg Gln Gly Arg Thr Leu Tyr Gly
1 5 10 15

<210> 3749
<211> 18
<212> PRT
<213> Bos taurus

<400> 3749

Asp Val Val Tyr Ala Leu Lys Arg Gln Gly Arg Thr Leu Tyr Gly Phe
1 5 10 15

Gly Gly

<210> 3750
<211> 13
<212> PRT
<213> Artemia franciscana

<400> 3750

Glu Glu Glu Asp Glu Asp Met Gly Phe Gly Leu Phe Asp
1 5 10

<210> 3751
<211> 22
<212> PRT
<213> Homo sapiens

<400> 3751

Glu Leu Tyr Lys Glu Lys Ala Leu Ser Val Glu Thr Glu Lys Leu Leu
1 5 10 15

Lys Tyr Leu Glu Ala Val
20

<210> 3752
<211> 24
<212> PRT
<213> Homo sapiens

<400> 3752

Glu Pro Ala Val Tyr Phe Lys Glu Gln Phe Leu Asp Gly Asp Gly Trp
1 5 10 15

Thr Ser Arg Trp Ile Glu Ser Lys
20

<210> 3753
<211> 15
<212> PRT
<213> Bos taurus

<400> 3753

Gly Ile Thr Lys Pro Ala Ile Arg Arg Leu Ala Arg Arg Gly Gly
1 5 10 15

<210> 3754
<211> 23
<212> PRT
<213> Homo sapiens

<400> 3754

Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg
1 5 10 15

Gly Arg Gly Gly Pro Arg Arg
20

<210> 3755
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3755

Gly Ser Gly Lys Gly Lys Val Gln Phe Gln Gly Lys Lys Thr Lys Phe
1 5 10 15

<210> 3756
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3756

Lys Ala Leu Ser Val Glu Thr Glu Lys Leu Leu Lys Tyr Leu Glu Ala
1 5 10 15

Val

<210> 3757
<211> 24
<212> PRT
<213> Homo sapiens

<400> 3757

Lys Leu Ile Val Cys Gly Met Thr Ser Asn Gly Phe Thr Ile Ala Asp
1 5 10 15

Pro Asp Asp Arg Gly Met Leu Asp
20

<210> 3758
<211> 24

<212> PRT
<213> Homo sapiens

<400> 3758

Lys Met Thr Leu Lys Asn Arg Glu Pro Val Gln Leu Glu Thr Leu Ser
1 5 10 15

Ile Arg Gly Asn Arg Ile Arg Tyr
20

<210> 3759
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3759

Lys Pro Lys Ala Ala Lys Pro Lys Lys Ala Ala Ala Lys Lys Lys
1 5 10 15

<210> 3760
<211> 11
<212> PRT
<213> Homo sapiens

<400> 3760

Met Ala Val Pro Glu Thr Arg Pro Asn His Thr
1 5 10

<210> 3761
<211> 23
<212> PRT
<213> Homo sapiens

<400> 3761

Met Glu Glu Ser Val Asn Gln Met Gln Pro Leu Asn Glu Lys Gln Ile
1 5 10 15

Ala Asn Ser Gln Asp Gly Tyr
20

<210> 3762
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3762

Met Lys Leu Val Arg Phe Leu Met Lys Leu Ser His Glu Thr Val Thr
1 5 10 15

Ile Glu Leu Lys
20

<210> 3763
<211> 17
<212> PRT
<213> Enterovirus A

<400> 3763

Met Val Thr Ser Thr Ile Thr Glu Lys Leu Leu Lys Asn Leu Val Lys
1 5 10 15

Ile

<210> 3764
<211> 10
<212> PRT
<213> Homo sapiens

<400> 3764

Asn Gly Trp Ser His Lys Asp Leu Leu Arg
1 5 10

<210> 3765
<211> 7
<212> PRT
<213> Homo sapiens

<400> 3765

Pro Pro Gly Met Arg Pro Pro
1 5

<210> 3766
<211> 21
<212> PRT
<213> Mus musculus

<400> 3766

Pro Thr Arg Ala Glu Thr Arg Glu Glu Arg Met Glu Arg Lys Arg Arg
1 5 10 15

Glu Lys Ile Glu Arg
20

<210> 3767
<211> 11
<212> PRT
<213> Homo sapiens

<400> 3767

Pro Thr Arg Ala Pro Ser Gly Pro Arg Pro Pro
1 5 10

<210> 3768
<211> 21
<212> PRT
<213> Mus musculus

<400> 3768

Arg Ile His Met Val Tyr Ser Lys Arg Ser Gly Lys Pro Arg Gly Tyr
1 5 10 15

Ala Phe Ile Glu Tyr
20

<210> 3769
<211> 21
<212> PRT
<213> Mus musculus

<400> 3769

Arg Ile His Met Val Tyr Ser Lys Arg Ser Gly Lys Pro Arg Gly Tyr
1 5 10 15

Ala Phe Ile Glu Tyr
20

<210> 3770
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3770

Arg Pro Asp Ala Glu Tyr Trp Asn Ser Gln Lys Asp Leu Leu Glu Gln
1 5 10 15

Lys Arg Gly Arg
20

<210> 3771
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3771

Arg Pro Asp Ala Glu Tyr Trp Asn Ser Gln Lys Asp Leu Leu Glu Gln
1 5 10 15

Arg Arg Ala Ala
20

<210> 3772

<211> 11
<212> PRT
<213> Homo sapiens

<400> 3772

Arg Arg Arg Glu Gly Pro Asp Arg Ser Pro Arg
1 5 10

<210> 3773
<211> 29
<212> PRT
<213> Bos taurus

<400> 3773

Ser Gly Arg Gly Lys Gly Gly Lys Gly Leu Gly Lys Gly Gly Ala Lys
1 5 10 15

Arg His Arg Lys Val Leu Arg Asp Asn Ile Gln Gly Ile
20 25

<210> 3774
<211> 24
<212> PRT
<213> Homo sapiens

<400> 3774

Ser Gln Phe Gly Gln Ile Leu Asp Ile Leu Val Ser Arg Ser Leu Lys
1 5 10 15

Met Arg Gly Gln Ala Phe Val Ile
20

<210> 3775
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3775

Thr Gly Ala Leu Asp Val Ile Arg Asn Phe Thr Leu Asp Met Ile
1 5 10 15

<210> 3776
<211> 18
<212> PRT
<213> Bos taurus

<400> 3776

Thr Lys Pro Ala Ile Arg Arg Leu Ala Arg Arg Gly Gly Val Lys Arg
1 5 10 15

Ile Ser

<210> 3777
<211> 22
<212> PRT
<213> Homo sapiens

<400> 3777

Thr Lys Tyr Lys Gln Arg Asn Gly Trp Ser His Lys Asp Leu Leu Arg
1 5 10 15

Leu Ser His Leu Lys Pro
20

<210> 3778
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3778

Thr Leu His Lys Ala Phe Lys Gly Ser Ile Phe Val Val Phe Asp Ser
1 5 10 15

Ile Glu Ser Ala
20

<210> 3779
<211> 21
<212> PRT
<213> Homo sapiens

<400> 3779

Val Cys Glu Lys Leu Cys Asn Glu Lys Leu Leu Lys Lys Ala Arg Ile
1 5 10 15

His Pro Phe His Ile
20

<210> 3780
<211> 37
<212> PRT
<213> Homo sapiens

<400> 3780

Val Glu Pro Lys Val Lys Ser Lys Lys Arg Glu Ala Val Ala Gly Arg
1 5 10 15

Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg
20 25 30

Gly Gly Pro Arg Arg
35

<210> 3781
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3781

Val Ser Lys Asp Asp Ser Ile Ile Ser Ser Leu Asp Val Thr Asp
1 5 10 15

<210> 3782
<211> 20
<212> PRT
<213> Mus musculus

<400> 3782

Tyr Asp Glu Arg Pro Gly Pro Ser Pro Leu Pro His Arg Asp Arg Asp
1 5 10 15

Arg Asp Arg Glu
20

<210> 3783
<211> 21
<212> PRT
<213> Mus musculus

<400> 3783

Tyr Leu Pro Pro Leu Glu Lys Leu Pro His Glu Lys His His Asn Gln
1 5 10 15

Pro Tyr Cys Gly Ile
20

<210> 3784
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3784

Ala Ala Arg Gly Arg Gly Arg Gly Met Gly Arg Gly Asn Ile Phe
1 5 10 15

<210> 3785
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3785

Ala Ala Arg Gly Arg Gly Arg Gly Met Gly Arg Gly Asn Ile Phe
1 5 10 15

<210> 3786
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3786

Ala Ile Ala Leu Arg Glu Tyr Arg Lys Lys Met Asp Ile Pro Ala
1 5 10 15

<210> 3787
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3787

Ala Ile Val Thr Lys Tyr Ile Thr Lys Gly Trp Lys Glu Val His Glu
1 5 10 15

Leu Tyr Lys Glu
20

<210> 3788
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3788

Ala Asn Asn Gly Asn Leu Gln Leu Arg Asn Lys Glu Val Thr Trp Glu
1 5 10 15

Val Leu Glu Gly
20

<210> 3789
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3789

Ala Arg Gly Arg Gly Arg Gly Met Gly Arg Gly Asn Ile Phe Gln
1 5 10 15

<210> 3790
<211> 3
<212> PRT
<213> Homo sapiens

<400> 3790

Cys Val Pro
1

<210> 3791
<211> 6
<212> PRT
<213> Homo sapiens

<400> 3791

Asp Gly Gln Phe Cys His
1 5

<210> 3792
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3792

Asp Leu Leu Arg Leu Ser His Leu Lys Pro Ser Ser Glu Gly Leu Ala
1 5 10 15

Ile Val Thr Lys
20

<210> 3793
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3793

Asp Val Glu Pro Lys Val Lys Ser Lys Lys Arg Glu Ala Val Ala
1 5 10 15

<210> 3794
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3794

Asp Val Glu Pro Lys Val Lys Ser Lys Lys Arg Glu Ala Val Ala
1 5 10 15

<210> 3795
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3795

Glu Ala Val Ala Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly
1 5 10 15

<210> 3796
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3796

Glu Lys Ala Leu Ser Val Glu Thr Glu Lys Leu Leu Lys Tyr Leu Glu
1 5 10 15

Ala Val

<210> 3797
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3797

Glu Arg Asp Arg Lys Arg Glu Lys Arg Lys Pro Lys Ser
1 5 10

<210> 3798
<211> 8
<212> PRT
<213> Homo sapiens

<400> 3798

Gly Gln Ile Pro Pro Gly Ala Met
1 5

<210> 3799
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3799

Gly Arg Gly Arg Gly Met Gly Arg Gly Asn Ile Phe Gln Lys Arg
1 5 10 15

<210> 3800
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3800

Gly Arg Gly Arg Gly Arg Gly Arg Gly Gly Pro Arg Arg
1 5 10

<210> 3801
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3801

Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Gly Pro Arg Arg
1 5 10 15

<210> 3802
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3802

Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Gly Pro Arg Arg
1 5 10 15

<210> 3803
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3803

Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly
1 5 10

<210> 3804
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3804

Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Gly Pro
1 5 10 15

<210> 3805
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3805

Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly
1 5 10 15

<210> 3806
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3806

Gly Arg Gly Thr Val Ala Ala Ala Ala Ala Ala Ala Thr
1 5 10

<210> 3807

<211> 16
<212> PRT
<213> Homo sapiens

<400> 3807

Gly Ser Gly Lys Gly Lys Val Gln Phe Gln Gly Lys Lys Thr Lys Phe
1 5 10 15

<210> 3808
<211> 12
<212> PRT
<213> Homo sapiens

<400> 3808

His Met Val Tyr Ser Lys Arg Ser Gly Lys Pro Arg
1 5 10

<210> 3809
<211> 27
<212> PRT
<213> Homo sapiens

<400> 3809

Ile Pro Pro Gly Arg Gly Thr Pro Met Gly Met Pro Pro Pro Gly Met
1 5 10 15

Arg Pro Pro Pro Pro Gly Met Arg Gly Leu Leu
20 25

<210> 3810
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3810

Lys Ala Leu Ser Val Glu Thr Glu Lys Leu Leu Lys Tyr Leu Glu Ala
1 5 10 15

Val Glu Lys Val
20

<210> 3811
<211> 12
<212> PRT
<213> Homo sapiens

<400> 3811

Lys Glu Glu Gly Ser Arg Ser Asn Leu Gly Trp Leu
1 5 10

<210> 3812

<211> 12
<212> PRT
<213> Mus musculus

<400> 3812

Lys Phe Lys Gly Lys Ala Thr Leu Thr Ser Asp Lys
1 5 10

<210> 3813
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3813

Lys Arg Glu Ala Val Ala Gly Arg Gly Arg Gly Arg Gly Arg Gly
1 5 10 15

<210> 3814
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3814

Lys Arg Thr Lys Asp Glu Leu Glu Val Ile His Leu Ile Glu Glu His
1 5 10 15

Arg Leu Val Arg
20

<210> 3815
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3815

Lys Val Lys Ser Lys Lys Arg Glu Ala Val Ala Gly Arg
1 5 10

<210> 3816
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3816

Leu Asp Gly Pro Thr Tyr Lys Arg Arg Leu Asp Glu Cys Glu Glu
1 5 10 15

<210> 3817
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3817

Leu Lys Ala Val Lys Met Thr Leu Lys Asn Arg Glu Pro
1 5 10

<210> 3818
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3818

Leu Lys Tyr Tyr Leu Ala Pro Lys Ile Glu Asp Glu Glu Gly Ser
1 5 10 15

<210> 3819
<211> 39
<212> PRT
<213> Homo sapiens

<400> 3819

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

Glu Ala Leu Lys Asp Leu Ile Asn Glu Ala Cys Trp Asp Ile Ser Ser
20 25 30

Ser Gly Val Asn Leu Gln Ser
35

<210> 3820
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3820

Asn Thr His Leu Lys Ala Val Lys Met Thr Leu Lys Asn
1 5 10

<210> 3821
<211> 12
<212> PRT
<213> Homo sapiens

<400> 3821

Asn Trp His Gln Leu His Gly Lys Lys Glu Ala Tyr
1 5 10

<210> 3822
<211> 13
<212> PRT
<213> Bos taurus

<400> 3822

Pro Glu Pro Ala Lys Ser Ala Pro Ala Pro Lys Lys Gly
1 5 10

<210> 3823
<211> 25
<212> PRT
<213> Bos taurus

<400> 3823

Pro Glu Pro Ala Lys Ser Ala Pro Ala Pro Lys Lys Gly Ser Lys Lys
1 5 10 15

Ala Val Thr Lys Ala Gln Lys Lys Asp
20 25

<210> 3824
<211> 7
<212> PRT
<213> Simian virus 40

<400> 3824

Pro Lys Lys Lys Arg Lys Val
1 5

<210> 3825
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3825

Pro Lys Val Lys Ser Lys Lys Arg Glu Ala Val Ala Gly Arg Gly
1 5 10 15

<210> 3826
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3826

Pro Lys Val Lys Ser Lys Lys Arg Glu Ala Val Ala Gly Arg Gly
1 5 10 15

<210> 3827
<211> 35
<212> PRT
<213> Homo sapiens

<400> 3827

Pro Lys Val Lys Ser Lys Lys Arg Glu Ala Val Ala Gly Arg Gly Arg
1 5 10 15

Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Gly
20 25 30

Pro Arg Arg
35

<210> 3828
<211> 12
<212> PRT
<213> Homo sapiens

<400> 3828

Gln Gly Phe Pro Phe Tyr Asp Lys Pro Met Arg Ile
1 5 10

<210> 3829
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3829

Gln Val Ala Ala Arg Gly Arg Gly Arg Gly Met Gly Arg Gly Asn
1 5 10 15

<210> 3830
<211> 6
<212> PRT
<213> Homo sapiens

<400> 3830

Gln Val Lys Gly Phe Val
1 5

<210> 3831
<211> 40
<212> PRT
<213> Homo sapiens

<400> 3831

Gln Tyr Pro Pro Gly Arg Gly Gly Pro Pro Pro Pro Met Gly Arg Gly
1 5 10 15

Ala Pro Pro Pro Gly Met Met Gly Pro Pro Pro Gly Met Arg Pro Pro
20 25 30

Met Gly Pro Pro Met Gly Ile Pro
35 40

<210> 3832

<211> 12
<212> PRT
<213> Homo sapiens

<400> 3832

Arg Cys Arg Leu Cys Asp Glu Gly His Gly Leu Glu
1 5 10

<210> 3833
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3833

Arg Glu Ala Val Ala Gly Arg Gly Arg Gly Arg Gly Arg
1 5 10

<210> 3834
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3834

Arg Gly Arg Gly Met Gly Arg Gly Asn Ile Phe Gln Lys Arg Arg
1 5 10 15

<210> 3835
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3835

Arg Gly Arg Gly Arg Gly Met Gly Arg Gly Asn Ile Phe Gln Lys
1 5 10 15

<210> 3836
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3836

Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Gly
1 5 10

<210> 3837
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3837

Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg
1 5 10

<210> 3838
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3838

Ser Lys Lys Arg Glu Ala Val Ala Gly Arg Gly Arg Gly
1 5 10

<210> 3839
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3839

Ser Lys Lys Arg Glu Ala Val Ala Gly Arg Gly Arg Gly Arg Gly
1 5 10 15

<210> 3840
<211> 22
<212> PRT
<213> Homo sapiens

<400> 3840

Thr Lys Tyr Lys Gln Arg Asn Gly Trp Ser His Lys Asp Leu Leu Arg
1 5 10 15

Leu Ser His Leu Lys Pro
20

<210> 3841
<211> 22
<212> PRT
<213> Homo sapiens

<400> 3841

Thr Lys Tyr Lys Gln Arg Asn Gly Trp Ser His Lys Asp Leu Leu Arg
1 5 10 15

Leu Ser His Leu Lys Pro
20

<210> 3842
<211> 12
<212> PRT
<213> Homo sapiens

<400> 3842

Thr Val Glu Thr Gln Asn Leu Glu Gly Leu His His
1 5 10

<210> 3843
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3843

Val Ala Ala Arg Gly Arg Gly Arg Gly Met Gly Arg Gly Asn Ile
1 5 10 15

<210> 3844
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3844

Val Ala Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly
1 5 10

<210> 3845
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3845

Val Ala Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly
1 5 10 15

<210> 3846
<211> 25
<212> PRT
<213> Homo sapiens

<400> 3846

Val Ala Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg
1 5 10 15

Gly Arg Gly Arg Gly Gly Pro Arg Arg
20 25

<210> 3847
<211> 6
<212> PRT
<213> Homo sapiens

<400> 3847

Val Cys Glu His Cys Asp
1 5

<210> 3848
<211> 35

<212> PRT
<213> Homo sapiens

<400> 3848

Val Glu Pro Lys Val Lys Lys Arg Glu Ala Val Ala Gly Arg Gly Arg
1 5 10 15

Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Gly
20 25 30

Pro Arg Arg
35

<210> 3849
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3849

Val Glu Pro Lys Val Lys Ser Lys Lys Arg Glu Ala Val
1 5 10

<210> 3850
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3850

Val Glu Pro Lys Val Lys Ser Lys Lys Arg Glu Ala Val Ala Gly
1 5 10 15

<210> 3851
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3851

Val Glu Pro Lys Val Lys Ser Lys Lys Arg Glu Ala Val Ala Gly
1 5 10 15

<210> 3852
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<400> 3852

Val Lys Ser Lys Lys Arg Glu Ala Val Ala Gly Arg Gly Arg Gly
1 5 10 15

<210> 3853
<211> 15

<212> PRT
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<400> 3853

Val Lys Ser Lys Lys Arg Glu Ala Val Ala Gly Arg Gly Arg Gly
1 5 10 15

<210> 3854
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<400> 3854

Val Leu Val Asp Val Glu Arg Gly Arg Thr Val
1 5 10

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<400> 3855

Val Ser Met Asn Thr His Leu Lys Ala Val Lys Met Thr
1 5 10

<210> 3856
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<400> 3856

Tyr Ile Thr Thr Ile Ala Gly Val Met
1 5

<210> 3857
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<400> 3857

Tyr Lys Gln Arg Asn Gly Trp Ser His Lys Asp Leu Leu Arg Leu Ser
1 5 10 15

His Leu Lys Pro
20

<210> 3858
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<213> Homo sapiens

<400> 3858

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Met Ser Gly Trp Glu Ser Tyr Tyr Lys Thr Glu Gly Asp Glu Glu Ala
1               5                  10                  15

Glu Glu Glu Gln Glu Glu Asn Leu Glu Ala Ser Gly Asp Tyr Lys Tyr
            20                  25                  30

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

Phe Glu Ser Gln Ser Glu Asp Glu Leu Thr Pro Phe Asp Met Ser Ile
    50                  55                  60

Gln Cys Ile Gln Ser Val Tyr Ile Ser Lys Ile Ile Ser Ser Asp Arg
65                  70                  75                  80

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

Val Asn Phe Lys Asn Ile Tyr Val Leu Gln Glu Leu Asp Asn Pro Gly
            100                 105                 110

Ala Lys Arg Ile Leu Glu Leu Asp Gln Phe Lys Gly Gln Gln Gly Gln
        115                 120                 125

Lys Arg Phe Gln Asp Met Met Gly His Gly Ser Asp Tyr Ser Leu Ser
    130                 135                 140

Glu Val Leu Trp Val Cys Ala Asn Leu Phe Ser Asp Val Gln Phe Lys
145                 150                 155                 160

Met Ser His Lys Arg Ile Met Leu Phe Thr Asn Glu Asp Asn Pro His
                165                 170                 175

Gly Asn Asp Ser Ala Lys Ala Ser Arg Ala Arg Thr Lys Ala Gly Asp
            180                 185                 190

Leu Arg Asp Thr Gly Ile Phe Leu Asp Leu Met His Leu Lys Lys Pro
        195                 200                 205

Gly Gly Phe Asp Ile Ser Leu Phe Tyr Arg Asp Ile Ile Ser Ile Ala
    210                 215                 220

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

Asp Leu Leu Arg Lys Val Arg Ala Lys Glu Thr Arg Lys Arg Ala Leu
                245                 250                 255
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Ser Arg Leu Lys Leu Lys Leu Asn Lys Asp Ile Val Ile Ser Val Gly
            260                 265                 270

Ile Tyr Asn Leu Val Gln Lys Ala Leu Lys Pro Pro Pro Ile Lys Leu
        275                 280                 285

Tyr Arg Glu Thr Asn Glu Pro Val Lys Thr Lys Thr Arg Thr Phe Asn
    290                 295                 300

Thr Ser Thr Gly Gly Leu Leu Leu Pro Ser Asp Thr Lys Arg Ser Gln
305                 310                 315                 320

Ile Tyr Gly Ser Arg Gln Ile Ile Leu Glu Lys Glu Glu Thr Glu Glu
                325                 330                 335

Leu Lys Arg Phe Asp Asp Pro Gly Leu Met Leu Met Gly Phe Lys Pro
            340                 345                 350

Leu Val Leu Leu Lys Lys His His Tyr Leu Arg Pro Ser Leu Phe Val
        355                 360                 365

Tyr Pro Glu Glu Ser Leu Val Ile Gly Ser Ser Thr Leu Phe Ser Ala
    370                 375                 380

Leu Leu Ile Lys Cys Leu Glu Lys Glu Val Ala Ala Leu Cys Arg Tyr
385                 390                 395                 400

Thr Pro Arg Arg Asn Ile Pro Pro Tyr Phe Val Ala Leu Val Pro Gln
                405                 410                 415

Glu Glu Glu Leu Asp Asp Gln Lys Ile Gln Val Thr Pro Pro Gly Phe
            420                 425                 430

Gln Leu Val Phe Leu Pro Phe Ala Asp Asp Lys Arg Lys Met Pro Phe
        435                 440                 445

Thr Glu Lys Ile Met Ala Thr Pro Glu Gln Val Gly Lys Met Lys Ala
    450                 455                 460

Ile Val Glu Lys Leu Arg Phe Thr Tyr Arg Ser Asp Ser Phe Glu Asn
465                 470                 475                 480

Pro Val Leu Gln Gln His Phe Arg Asn Leu Glu Ala Leu Ala Leu Asp
                485                 490                 495

Leu Met Glu Pro Glu Gln Ala Val Asp Leu Thr Leu Pro Lys Val Glu
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500 505 510

Ala Met Asn Lys Arg Leu Gly Ser Leu Val Asp Glu Phe Lys Glu Leu
515 520 525

Val Tyr Pro Pro Asp Tyr Asn Pro Glu Gly Lys Val Thr Lys Arg Lys
530 535 540

His Asp Asn Glu Gly Ser Gly Ser Lys Arg Pro Lys Val Glu Tyr Ser
545 550 555 560

Glu Glu Glu Leu Lys Thr His Ile Ser Lys Gly Thr Leu Gly Lys Phe
565 570 575

Thr Val Pro Met Leu Lys Glu Ala Cys Arg Ala Tyr Gly Leu Lys Ser
580 585 590

Gly Leu Lys Lys Gln Glu Leu Leu Glu Ala Leu Thr Lys His Phe Gln
595 600 605

Asp

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<211> 119
<212> PRT
<213> Homo sapiens

<400> 3859

Met Lys Leu Val Arg Phe Leu Met Lys Leu Ser His Glu Thr Val Thr
1 5 10 15

Ile Glu Leu Lys Asn Gly Thr Gln Val His Gly Thr Ile Thr Gly Val
20 25 30

Asp Val Ser Met Asn Thr His Leu Lys Ala Val Lys Met Thr Leu Lys
35 40 45

Asn Arg Glu Pro Val Gln Leu Glu Thr Leu Ser Ile Arg Gly Asn Asn
50 55 60

Ile Arg Tyr Phe Ile Leu Pro Asp Ser Leu Pro Leu Asp Thr Leu Leu
65 70 75 80

Val Asp Val Glu Pro Lys Val Lys Ser Lys Lys Arg Glu Ala Val Ala
85 90 95

Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg

100 105 110

Gly Arg Gly Gly Pro Arg Arg
115

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<400> 3860

Ala Ala Phe Tyr Lys Thr Phe Lys Thr Val
1 5 10

<210> 3861
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<212> PRT
<213> Homo sapiens

<400> 3861

Ala Glu Met Lys Ser Leu Glu Glu Lys Ile Gly Cys Leu Leu Lys
1 5 10 15

<210> 3862
<211> 11
<212> PRT
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<400> 3862

Ala Leu Leu Arg Asn Leu Gly Lys Met Thr Ala
1 5 10

<210> 3863
<211> 14
<212> PRT
<213> Homo sapiens

<400> 3863

Ala Leu Arg Glu Tyr Arg Lys Lys Met Asp Ile Pro Ala Lys
1 5 10

<210> 3864
<211> 9
<212> PRT
<213> Homo sapiens

<400> 3864

Ala Met Lys Ile Ser Phe Ala Lys Lys
1 5

<210> 3865

<211> 7
<212> PRT
<213> Homo sapiens

<400> 3865

Ala Pro Gly Met Arg Pro Pro
1 5

<210> 3866
<211> 10
<212> PRT
<213> Homo sapiens

<400> 3866

Ala Pro Pro Pro Gly Met Arg Pro Pro Met
1 5 10

<210> 3867
<211> 19
<212> PRT
<213> Mus musculus

<400> 3867

Ala Pro Gln Gly Ser Leu Gly Glu Tyr Leu Phe Glu Arg Leu Thr Leu
1 5 10 15

Lys His Asp

<210> 3868
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3868

Ala Thr Leu Asp Asp Ile Lys Glu Trp Leu Glu Asp Lys Gly Gln
1 5 10 15

<210> 3869
<211> 14
<212> PRT
<213> Homo sapiens

<400> 3869

Cys Ser Leu Pro Met Ile Trp Ala Gln Lys Thr Asn Thr Pro
1 5 10

<210> 3870
<211> 9
<212> PRT
<213> Homo sapiens

<400> 3870

Asp Arg Asn Gly Thr His Leu Asp Ala
1 5

<210> 3871
<211> 20
<212> PRT
<213> Mus musculus

<400> 3871

Asp Ser Cys Pro Leu Asp Cys Lys Val Tyr Val Gly Asn Leu Gly Asn
1 5 10 15

Asn Gly Asn Lys
20

<210> 3872
<211> 9
<212> PRT
<213> Homo sapiens

<400> 3872

Glu Ala Leu Thr Lys His Phe Gln Asp
1 5

<210> 3873
<211> 14
<212> PRT
<213> Homo sapiens

<400> 3873

Glu Ala Val Glu Lys Val Lys Arg Thr Lys Asp Glu Leu Glu
1 5 10

<210> 3874
<211> 14
<212> PRT
<213> Homo sapiens

<400> 3874

Glu Lys Val Lys Arg Thr Lys Asp Glu Leu Glu Val Ile His
1 5 10

<210> 3875
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3875

Glu Gln Glu Ala Lys Gln Lys Leu Glu Glu Asp Ala Glu Met Lys
1 5 10 15

<210> 3876
<211> 50
<212> PRT
<213> Homo sapiens

<400> 3876

Phe Asn Gly Thr Phe Val Lys Leu Asn Lys Ala Ser Ile Asn Met Leu
1 5 10 15

Arg Ile Val Glu Pro Tyr Ile Ala Trp Gly Tyr Pro Asn Leu Lys Ser
20 25 30

Val Asn Glu Leu Ile Tyr Lys Arg Gly Tyr Gly Lys Ile Asn Lys Lys
35 40 45

Arg Ile
50

<210> 3877
<211> 30
<212> PRT
<213> Homo sapiens

<400> 3877

Gly Asp Ala Phe Lys Thr Leu Phe Val Ala Arg Val Asn Tyr Asp Thr
1 5 10 15

Thr Glu Ser Lys Leu Arg Arg Glu Phe Glu Val Tyr Gly Pro
20 25 30

<210> 3878
<211> 21
<212> PRT
<213> Homo sapiens

<400> 3878

Gly Ile Ile Asp Leu Ile Glu Lys Arg Lys Phe Asn Gln Asn Ser Asn
1 5 10 15

Ser Thr Tyr Cys Val
20

<210> 3879
<211> 10
<212> PRT
<213> Homo sapiens

<400> 3879

Gly Ile Met Ala Pro Pro Pro Gly Met Arg

1 5 10

<210> 3880
<211> 10
<212> PRT
<213> Homo sapiens

<400> 3880

Gly Met Arg Pro Pro Met Gly Pro Pro Ile
1 5 10

<210> 3881
<211> 13
<212> PRT
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<400> 3881

Gly Gln Ile Leu Asp Ile Leu Val Ser Arg Ser Leu Lys
1 5 10

<210> 3882
<211> 20
<212> PRT
<213> Mus musculus

<400> 3882

His His Asn Thr Leu Val Cys Ser Val Thr Asp Phe Tyr Pro Ala Lys
1 5 10 15

Ile Lys Val Arg
20

<210> 3883
<211> 8
<212> PRT
<213> Homo sapiens

<400> 3883

His Lys Ala Phe Lys Gly Ser Ile
1 5

<210> 3884
<211> 8
<212> PRT
<213> Homo sapiens

<400> 3884

His Lys Gly Phe Lys Gly Val Asp
1 5

<210> 3885

<211> 16
<212> PRT
<213> Homo sapiens

<400> 3885

His Leu Leu Thr Asn His Leu Lys Ser Lys Glu Val Trp Lys Ala Leu
1 5 10 15

<210> 3886
<211> 20
<212> PRT
<213> Mus musculus

<400> 3886

His Leu Gln Leu Ala Ile Arg Asn Asp Glu Glu Leu Asn Lys Leu Leu
1 5 10 15

Gly Lys Val Thr
20

<210> 3887
<211> 18
<212> PRT
<213> Mus musculus

<400> 3887

His Pro Pro His Ile Glu Ile Gln Met Leu Lys Asn Gly Lys Lys Ile
1 5 10 15

Pro Lys

<210> 3888
<211> 9
<212> PRT
<213> Homo sapiens

<400> 3888

Ile Ile Ala Lys Met Lys Gly Thr Phe
1 5

<210> 3889
<211> 10
<212> PRT
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<400> 3889

Ile Met Ala Pro Pro Pro Gly Met Arg Pro
1 5 10

<210> 3890

<211> 15
<212> PRT
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<400> 3890

Lys Phe Val Glu Thr Pro Gly Gln Lys Tyr Lys Glu Thr Asp Leu
1 5 10 15

<210> 3891
<211> 11
<212> PRT
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<400> 3891

Lys Ile Lys Lys Asp Glu Leu Lys Lys Ser Leu
1 5 10

<210> 3892
<211> 15
<212> PRT
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<400> 3892

Leu Ala Val Thr Lys Tyr Lys Gln Arg Asn Gly Trp Ser His Lys
1 5 10 15

<210> 3893
<211> 40
<212> PRT
<213> Homo sapiens

<400> 3893

Leu Glu Lys Asp Glu Arg Glu Gln Leu Arg Ile Leu Gly Glu Lys Glu
1 5 10 15

Ala Lys Leu Ala Gln Gln Ser Gln Ala Leu Gln Glu Leu Ile Ser Glu
20 25 30

Leu Asp Arg Arg Cys His Ser Ser
35 40

<210> 3894
<211> 9
<212> PRT
<213> Homo sapiens

<400> 3894

Leu Lys Arg Val Cys Ala Gln Ile Asn
1 5

<210> 3895

<211> 36
<212> PRT
<213> Homo sapiens

<400> 3895

Leu Gln Glu Leu Glu Lys Asp Glu Arg Glu Gln Leu Arg Ile Leu Gly
1 5 10 15

Glu Lys Glu Ala Lys Leu Ala Gln Gln Ser Gln Ala Leu Gln Glu Leu
20 25 30

Ile Ser Glu Leu
35

<210> 3896
<211> 49
<212> PRT
<213> Homo sapiens

<400> 3896

Leu Gln Glu Leu Glu Lys Asp Glu Arg Glu Gln Leu Arg Ile Leu Gly
1 5 10 15

Glu Lys Glu Ala Lys Leu Ala Gln Gln Ser Gln Ala Leu Gln Glu Leu
20 25 30

Ile Ser Glu Leu Asp Arg Arg Cys His Ser Ser Ala Leu Glu Leu Leu
35 40 45

Gln

<210> 3897
<211> 9
<212> PRT
<213> Homo sapiens

<400> 3897

Leu Arg Leu Ser His Leu Lys Pro Ser
1 5

<210> 3898
<211> 30
<212> PRT
<213> Homo sapiens

<400> 3898

Leu Thr Leu Pro Lys Val Glu Ala Met Asn Lys Arg Leu Gly Ser Leu
1 5 10 15

Val Asp Glu Phe Lys Glu Leu Val Tyr Pro Pro Asp Tyr Asn
            20   25   30

<210> 3899
<211> 8
<212> PRT
<213> Homo sapiens

<400> 3899

Leu Tyr Lys Glu Lys Ala Leu Ser
1   5

<210> 3900
<211> 10
<212> PRT
<213> Homo sapiens

<400> 3900

Met Ala Pro Pro Pro Gly Met Arg Pro Pro
1   5   10

<210> 3901
<211> 26
<212> PRT
<213> Homo sapiens

<400> 3901

Met Glu Gly Val Glu Glu Lys Lys Lys Glu Val Pro Ala Val Pro Glu
1   5   10   15

Thr Leu Lys Lys Lys Arg Arg Asn Phe Ala
            20   25

<210> 3902
<211> 12
<212> PRT
<213> Homo sapiens

<400> 3902

Met Gly Arg Gly Ala Pro Pro Pro Gly Met Met Gly
1   5   10

<210> 3903
<211> 9
<212> PRT
<213> Homo sapiens

<400> 3903

Met Lys Cys Gly Met Trp Gly Arg Ala
1   5

<210> 3904
<211> 24
<212> PRT
<213> Homo sapiens

<400> 3904

Met Leu Arg Lys Ala Arg Arg Lys Leu Ile Tyr Glu Lys Ala Lys His
1 5 10 15

Tyr His Lys Glu Tyr Arg Gln Met
20

<210> 3905
<211> 10
<212> PRT
<213> Homo sapiens

<400> 3905

Met Arg Pro Pro Met Gly Pro Pro Ile Gly
1 5 10

<210> 3906
<211> 11
<212> PRT
<213> Homo sapiens

<400> 3906

Met Trp Gly Arg Ala Leu Arg Lys Ala Ile Ala
1 5 10

<210> 3907
<211> 14
<212> PRT
<213> Homo sapiens

<400> 3907

Asn Glu Lys Leu Leu Lys Lys Ala Arg Ile His Pro Phe His
1 5 10

<210> 3908
<211> 9
<212> PRT
<213> Homo sapiens

<400> 3908

Asn Leu Asn Glu Lys Ile Lys Lys Asp
1 5

<210> 3909
<211> 10
<212> PRT
<213> Homo sapiens

<400> 3909

Pro Gly Ile Met Ala Pro Pro Pro Gly Met
1 5 10

<210> 3910
<211> 10
<212> PRT
<213> Homo sapiens

<400> 3910

Pro Gly Met Arg Pro Pro Met Gly Pro Pro
1 5 10

<210> 3911
<211> 20
<212> PRT
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<400> 3911

Pro Gly Val Thr Val Lys Asp Val Asn Gln Gln Glu Phe Val Arg Ala
1 5 10 15

Leu Ala Ala Phe
20

<210> 3912
<211> 10
<212> PRT
<213> Homo sapiens

<400> 3912

Pro Pro Gly Met Arg Pro Pro Met Gly Pro
1 5 10

<210> 3913
<211> 8
<212> PRT
<213> Homo sapiens

<400> 3913

Pro Pro Pro Gly Ile Arg Gly Pro
1 5

<210> 3914
<211> 7
<212> PRT
<213> Homo sapiens

<400> 3914

Pro Pro Pro Gly Met Arg Pro

1 5

<210> 3915
<211> 8
<212> PRT
<213> Homo sapiens

<400> 3915

Pro Pro Pro Gly Met Arg Pro Pro
1 5

<210> 3916
<211> 10
<212> PRT
<213> Homo sapiens

<400> 3916

Pro Pro Pro Gly Met Arg Pro Pro Met Gly
1 5 10

<210> 3917
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3917

Gln Glu Met Pro Leu Thr Ala Leu Leu Arg Asn Leu Gly Lys Met Thr
1 5 10 15

<210> 3918
<211> 9
<212> PRT
<213> Homo sapiens

<400> 3918

Gln Glu Thr Pro Ala Thr Lys Lys Ala
1 5

<210> 3919
<211> 24
<212> PRT
<213> Homo sapiens

<400> 3919

Arg Ala Tyr Gly Leu Lys Ser Gly Leu Lys Lys Gln Glu Leu Leu Glu
1 5 10 15

Ala Leu Thr Lys His Phe Gln Asp
20

<210> 3920

<211> 34
<212> PRT
<213> Homo sapiens

<400> 3920

Arg Ile Leu Glu Leu Asp Gln Phe Lys Gly Gln Gln Gly Gln Lys Arg
1 5 10 15

Phe Gln Asp Met Met Gly His Gly Ser Asp Tyr Ser Leu Ser Glu Val
20 25 30

Leu Trp

<210> 3921
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3921

Arg Lys Gly His Phe Leu Leu Ser Ser Lys Ser Gly Phe Trp Thr Ile
1 5 10 15

Trp Leu

<210> 3922
<211> 14
<212> PRT
<213> Mus musculus

<400> 3922

Arg Met Val Asn His Phe Ile Ala Glu Phe Lys Arg Lys His
1 5 10

<210> 3923
<211> 15
<212> PRT
<213> Mus musculus

<400> 3923

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

<210> 3924
<211> 10
<212> PRT
<213> Homo sapiens

<400> 3924

Arg Ser Gly Lys Pro Arg Gly Tyr Ala Phe

1 5 10

<210> 3925
<211> 10
<212> PRT
<213> Homo sapiens

<400> 3925

Arg Ser Leu Lys Met Arg Gly Gln Ala Phe
1 5 10

<210> 3926
<211> 11
<212> PRT
<213> Homo sapiens

<400> 3926

Ser Asp Asp Asp Met Gly Phe Gly Leu Phe Asp
1 5 10

<210> 3927
<211> 12
<212> PRT
<213> Homo sapiens

<400> 3927

Ser Glu Glu Glu Leu Lys Thr His Ile Ser Lys Gly
1 5 10

<210> 3928
<211> 50
<212> PRT
<213> Homo sapiens

<400> 3928

Ser Glu Glu Glu Leu Lys Thr His Ile Ser Lys Gly Thr Leu Gly Lys
1 5 10 15

Phe Thr Val Pro Met Leu Lys Glu Ala Cys Arg Ala Tyr Gly Leu Lys
20 25 30

Ser Gly Leu Lys Lys Gln Glu Leu Leu Glu Ala Leu Thr Lys His Phe
35 40 45

Gln Asp
50

<210> 3929
<211> 9
<212> PRT
<213> Homo sapiens

<400> 3929

Ser Gln Glu Gly Arg Thr Thr Lys Gln
1 5

<210> 3930
<211> 21
<212> PRT
<213> Homo sapiens

<400> 3930

Ser Arg Ile His Ala Glu Phe Val Gln Gln Lys Asn Phe Leu Val Glu
1 5 10 15

Glu Glu Gln Arg Gln
20

<210> 3931
<211> 10
<212> PRT
<213> Homo sapiens

<400> 3931

Ser Thr Lys Gln Ala Ala Phe Lys Ala Val
1 5 10

<210> 3932
<211> 8
<212> PRT
<213> Homo sapiens

<400> 3932

Thr Glu Lys Leu Leu Lys Tyr Leu
1 5

<210> 3933
<211> 12
<212> PRT
<213> Homo sapiens

<400> 3933

Thr Phe Ile Gln Phe Lys Lys Asp Leu Lys Glu Ser
1 5 10

<210> 3934
<211> 11
<212> PRT
<213> Homo sapiens

<400> 3934

Thr Tyr Tyr Ile Lys Glu Gln Lys Leu Gly Leu

1 5 10

<210> 3935
<211> 9
<212> PRT
<213> Homo sapiens

<400> 3935

Val Glu Pro Thr Gly Lys Arg Phe Leu
1 5

<210> 3936
<211> 19
<212> PRT
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<400> 3936

Val Phe Arg Arg Tyr Val Glu Val Gly Arg Val Ala Tyr Ile Ser Phe
1 5 10 15

Ser Pro His

<210> 3937
<211> 12
<212> PRT
<213> Homo sapiens

<400> 3937

Val Gly Arg Ala Thr Pro Pro Pro Gly Ile Met Ala
1 5 10

<210> 3938
<211> 21
<212> PRT
<213> Homo sapiens

<400> 3938

Val Ser Leu Val Cys Glu Glu Lys Leu Cys Asn Glu Lys Leu Leu Lys
1 5 10 15

Lys Ala Arg Ile His
20

<210> 3939
<211> 13
<212> PRT
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<400> 3939

Val Thr Lys Tyr Ile Thr Lys Gly Trp Lys Glu Val His

1 5 10

<210> 3940
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<400> 3940

Val Val Lys Lys Gly Thr Asp Phe Gln Leu Asn Gln Leu Glu Gly Lys
1 5 10 15

Lys

<210> 3941
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3941

Tyr Lys Thr Gly His Gly Leu Arg Gly Lys Leu Lys Trp Arg Pro
1 5 10 15

<210> 3942
<211> 8
<212> PRT
<213> Homo sapiens

<400> 3942

Ala Ala Ala Ala Ala Pro Ala Lys
1 5

<210> 3943
<211> 22
<212> PRT
<213> Mus musculus

<400> 3943

Ala Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly
1 5 10 15

Arg Gly Arg Gly Ser Leu
20

<210> 3944
<211> 22
<212> PRT
<213> Homo sapiens

<400> 3944

Ala Lys Val Glu Ala Lys Glu Glu Ser Glu Glu Ser Asp Glu Asp Met

1 5 10 15

Gly Phe Gly Leu Phe Asp
20

<210> 3945
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3945

Ala Leu Gly Gly Asn Ser Ser Pro Ser Ala Lys Asp Ile Lys Lys
1 5 10 15

<210> 3946
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3946

Ala Pro Ala Ala Gly Ser Ala Pro Ala Ala Ala Glu Glu Lys Lys
1 5 10 15

<210> 3947
<211> 24
<212> PRT
<213> Homo sapiens

<400> 3947

Ala Val His Gly Glu Arg Leu His Leu Phe Cys Glu Lys Asp Gly Lys
1 5 10 15

Ala Leu Cys Trp Val Cys Ala Gln
20

<210> 3948
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3948

Cys Ala Phe Thr Gly Pro Leu Arg Pro Phe Phe Ser Pro Gly Phe Asn
1 5 10 15

<210> 3949
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3949

Cys His Ser Ser Ala Leu Glu Leu Leu Gln Glu Val Ile Ile Val

1 5 10 15

<210> 3950
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3950

Asp Asp Arg Leu Asn Lys Val Ile Ser Glu Leu Asn Gly Lys Asn
1 5 10 15

<210> 3951
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3951

Asp Glu Lys Lys Glu Glu Ser Glu Glu Ser Asp Asp Asp Met Gly
1 5 10 15

<210> 3952
<211> 8
<212> PRT
<213> Homo sapiens

<400> 3952

Asp Met Gly Phe Gly Leu Phe Asp
1 5

<210> 3953
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3953

Glu Cys Ile Ser Gln Val Gly Lys Gly Gly Gly Ser Val Cys Ala Val
1 5 10 15

<210> 3954
<211> 24
<212> PRT
<213> Homo sapiens

<400> 3954

Glu Glu Val Thr Cys Pro Ile Cys Leu Asp Pro Phe Val Glu Pro Val
1 5 10 15

Ser Ile Glu Cys Gly His Ser Phe
20

<210> 3955

<211> 15
<212> PRT
<213> Homo sapiens

<400> 3955

Glu Ser Glu Glu Ser Asp Asp Asp Met Gly Phe Gly Leu Phe Asp
1 5 10 15

<210> 3956
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3956

Phe His Ser Gly Lys His Tyr Trp Glu Val Asp Val Thr Gly Lys Glu
1 5 10 15

<210> 3957
<211> 15
<212> PRT
<213> Unknown

<220>
<223> epitope involved in systemic lupus

<400> 3957

Phe Ile Glu Trp Asn Lys Leu Arg Phe Arg Gln Gly Leu Glu Trp
1 5 10 15

<210> 3958
<211> 13
<212> PRT
<213> Unknown

<220>
<223> epitope involved in systemic lupus

<400> 3958

Gly Gly Gly Arg Asp Arg Asp Arg Asp Arg Gly Gly Gly
1 5 10

<210> 3959
<211> 8
<212> PRT
<213> Homo sapiens

<400> 3959

Gly Ile Ala Arg Val Pro Leu Ala
1 5

<210> 3960
<211> 15
<212> PRT

<213> Homo sapiens

<400> 3960

Gly Ile Glu Ala Asp Asp Asp Arg Leu Asn Lys Val Ile Ser Glu
1 5 10 15

<210> 3961
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3961

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

<210> 3962
<211> 20
<212> PRT
<213> Homo sapiens

<400> 3962

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

His Ala Met Val
20

<210> 3963
<211> 23
<212> PRT
<213> Homo sapiens

<400> 3963

Gly Lys Lys Lys Ser Lys Pro Val Asn Lys Asp Arg Tyr Ile Ser Lys
1 5 10 15

Met Phe Leu Arg Gly Asp Ser
20

<210> 3964
<211> 15
<212> PRT
<213> Human Endogenous Retrovirus

<400> 3964

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

<210> 3965
<211> 16
<212> PRT

<213> Homo sapiens

<400> 3965

Gly Leu Lys Lys Met Leu Arg Thr Cys Ala Val His Ile Thr Leu Asp
1 5 10 15

<210> 3966
<211> 11
<212> PRT
<213> Homo sapiens

<400> 3966

Gly Ser Ile Tyr Asn Pro Glu Val Leu Asp Ile
1 5 10

<210> 3967
<211> 8
<212> PRT
<213> Homo sapiens

<400> 3967

Gly Val Gly Gly Pro Ser Gln Gln
1 5

<210> 3968
<211> 8
<212> PRT
<213> Homo sapiens

<400> 3968

Gly Val Gly Arg Ala Ala Gly Arg
1 5

<210> 3969
<211> 8
<212> PRT
<213> Homo sapiens

<400> 3969

Gly Val Pro Ala Gly Val Pro Ile
1 5

<210> 3970
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3970

Ile Glu Asp Val Ile Ala Gln Gly Ile Gly Lys Leu Ala Ser Val
1 5 10 15

<210> 3971
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3971

Ile Trp Leu Trp Asn Lys Gln Lys Tyr Glu Ala Gly Thr Tyr Pro Gln
1 5 10 15

Thr

<210> 3972
<211> 23
<212> PRT
<213> Homo sapiens

<400> 3972

Lys Ala Gln Val Ala Ala Arg Gly Arg Gly Arg Gly Met Gly Arg Gly
1 5 10 15

Asn Ile Phe Gln Lys Arg Arg
20

<210> 3973
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3973

Lys Asp Ile Lys Lys Ile Leu Asp Ser Val Gly Ile Glu Ala Asp
1 5 10 15

<210> 3974
<211> 18
<212> PRT
<213> Homo sapiens

<400> 3974

Lys Glu Ile Ser Gln Glu Ala Arg Glu Gly Thr Gln Gly Glu Arg Cys
1 5 10 15

Ala Val

<210> 3975
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3975

Leu Asn Gly Lys Asn Ile Glu Asp Val Ile Ala Gln Gly Ile Gly
1 5 10 15

<210> 3976
<211> 16
<212> PRT
<213> Homo sapiens

<400> 3976

Leu Ser Glu Asp Arg Arg Gln Val Arg Leu Gly Asp Thr Gln Gln Ser
1 5 10 15

<210> 3977
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3977

Met Ala Ser Ala Ala Arg Leu Thr Met Met Trp Glu Glu
1 5 10

<210> 3978
<211> 31
<212> PRT
<213> Homo sapiens

<400> 3978

Met Leu Lys Asn Ala Pro Met Leu Lys Ser Met Lys Asn Lys Asn Gln
1 5 10 15

Gly Ser Gly Ala Gly Arg Gly Lys Ala Ala Ile Leu Lys Ala Gln
20 25 30

<210> 3979
<211> 8
<212> PRT
<213> Homo sapiens

<400> 3979

Met Met Arg Lys Ala Ile Arg Gly
1 5

<210> 3980
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3980

Met Ser Leu Leu Asn Lys Pro Lys Ser Glu Met Thr Pro
1 5 10

<210> 3981
<211> 17
<212> PRT
<213> Homo sapiens

<400> 3981

Asn Ile Thr Asp His Gly Ser Leu Ile Tyr Ser Phe Ser Glu Cys Ala
1 5 10 15

Phe

<210> 3982
<211> 21
<212> PRT
<213> Homo sapiens

<400> 3982

Asn Ser Gln Asp Gly Tyr Val Trp Gln Val Thr Asp Met Asn Arg Leu
1 5 10 15

His Arg Phe Leu Cys
20

<210> 3983
<211> 15
<212> PRT
<213> Homo sapiens

<400> 3983

Pro Ala Gly Gly Ala Val Ala Val Ser Ala Ala Pro Gly Ser Ala
1 5 10 15

<210> 3984
<211> 8
<212> PRT
<213> Homo sapiens

<400> 3984

Pro Ala Pro Gly Met Arg Pro Pro
1 5

<210> 3985
<211> 18
<212> PRT
<213> Mus musculus

<400> 3985

Pro Glu Pro Ala Lys Ser Ala Pro Ala Pro Lys Lys Gly Ser Lys Lys
1 5 10 15

Ala Val

<210> 3986
<211> 18
<212> PRT
<213> Mus musculus

<400> 3986

Pro Glu Pro Ala Lys Ser Ala Pro Ala Pro Lys Lys Gly Ser Lys Lys
1 5 10 15

Ala Val

<210> 3987
<211> 49
<212> PRT
<213> Mus musculus

<400> 3987

Pro Leu Phe Pro Ala Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly
1 5 10 15

Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly
20 25 30

Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Ser Leu Ile Tyr
35 40 45

Ile

<210> 3988
<211> 7
<212> PRT
<213> Homo sapiens

<400> 3988

Pro Pro Gly Ile Arg Gly Pro
1 5

<210> 3989
<211> 8
<212> PRT
<213> Homo sapiens

<400> 3989

Pro Pro Pro Gly Met Ile Pro Pro
1 5

<210> 3990
<211> 8
<212> PRT
<213> Homo sapiens

<400> 3990

Pro Pro Pro Gly Met Arg Gly Pro
1 5

<210> 3991
<211> 19
<212> PRT
<213> Homo sapiens

<400> 3991

Pro Gln Thr Pro Leu His Leu Gln Val Pro Pro Cys Gln Val Gly Ile
1 5 10 15

Phe Leu Asp

<210> 3992
<211> 13
<212> PRT
<213> Homo sapiens

<400> 3992

Gln Ala Leu Gly Ile Thr Thr Lys Ile Ser Arg Gly Thr
1 5 10

<210> 3993
<211> 9
<212> PRT
<213> Homo sapiens

<400> 3993

Gln Val Tyr Ile Arg Gly Ser Lys Ile
1 5

<210> 3994
<211> 8
<212> PRT
<213> Homo sapiens

<400> 3994

Arg Ala Thr Trp Lys Ser Asn Tyr
1 5

<210> 3995
<211> 15
<212> PRT

<213> Homo sapiens

<400> 3995

Arg Asp Met Leu Leu Ala Asn Lys Val Pro Ala Ala Ala Arg Ala
1 5 10 15

<210> 3996
<211> 11
<212> PRT
<213> Homo sapiens

<400> 3996

Arg Asp Arg Asp Arg Asp Arg Asp Arg Asp Arg
1 5 10

<210> 3997
<211> 8
<212> PRT
<213> Homo sapiens

<400> 3997

Arg Asp Arg Asp Arg Asp Arg Glu
1 5

<210> 3998
<211> 8
<212> PRT
<213> Homo sapiens

<400> 3998

Arg Asn Pro Leu Ile Ala Gly Lys
1 5

<210> 3999
<211> 13
<212> PRT
<213> Bos taurus

<400> 3999

Ser Ala Pro Ala Pro Lys Lys Gly Ser Lys Lys Ala Val
1 5 10

<210> 4000
<211> 17
<212> PRT
<213> Homo sapiens

<400> 4000

Ser Pro Gly Phe Asn Asp Gly Gly Lys Asn Thr Ala Pro Leu Thr Leu
1 5 10 15

Cys

<210> 4001
<211> 17
<212> PRT
<213> Homo sapiens

<400> 4001

Ser Gln Ala Leu Gln Glu Leu Ile Ser Glu Leu Asp Arg Arg Cys His
1 5 10 15

Ser

<210> 4002
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4002

Ser Ser Pro Ser Ala Lys Asp Ile Lys Lys Ile Leu Asp Ser Val
1 5 10 15

<210> 4003
<211> 12
<212> PRT
<213> Homo sapiens

<400> 4003

Ser Val Leu Thr Gln Ser Val Lys Asn Asn Thr Gln
1 5 10

<210> 4004
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4004

Ser Val Ser Tyr Asp Asp Trp Asp Tyr Ser Leu Glu Ala Arg Val
1 5 10 15

<210> 4005
<211> 14
<212> PRT
<213> Homo sapiens

<400> 4005

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

<210> 4006
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4006

Val Ala Val Ser Ala Ala Pro Gly Ser Ala Ala Pro Ala Ala Gly
1 5 10 15

<210> 4007
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4007

Val Cys Ala Val Cys Arg Gln Arg Phe Leu Leu Lys Asn Leu Arg
1 5 10 15

<210> 4008
<211> 16
<212> PRT
<213> Homo sapiens

<400> 4008

Val His Gly Glu Arg Leu His Leu Phe Cys Glu Lys Asp Gly Lys Ala
1 5 10 15

<210> 4009
<211> 11
<212> PRT
<213> Homo sapiens

<400> 4009

Trp Thr Glu Val Pro Lys Ser Gly Lys Gly Lys
1 5 10

<210> 4010
<211> 17
<212> PRT
<213> Homo sapiens

<400> 4010

Tyr Gln Glu Lys Leu Gln Val Ala Leu Gly Glu Leu Arg Arg Lys Gln
1 5 10 15

Glu

<210> 4011
<211> 14
<212> PRT
<213> Homo sapiens

<400> 4011

Ala Glu Thr Arg Glu Glu Arg Met Glu Arg Lys Arg Arg Glu
1 5 10

<210> 4012
<211> 9
<212> PRT
<213> Homo sapiens

<400> 4012

Ala Phe Gln Gln Gly Lys Ile Pro Pro
1 5

<210> 4013
<211> 22
<212> PRT
<213> Homo sapiens

<400> 4013

Ala Lys Gly Lys Pro Asp Ala Ala Lys Lys Gly Val Val Lys Ala Glu
1 5 10 15

Lys Ser Lys Lys Lys Lys
20

<210> 4014
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4014

Glu Glu Ala Ser Gly Ser Ser Val Thr Ala Glu Glu Ala Lys Lys Phe
1 5 10 15

Leu Ala Pro Lys
20

<210> 4015
<211> 8
<212> PRT
<213> Homo sapiens

<400> 4015

Gly Met Met Pro Ala Pro His Met
1 5

<210> 4016
<211> 9
<212> PRT
<213> Homo sapiens

<400> 4016

Gly Pro Ala Pro Gly Met Arg Pro Pro
1 5

<210> 4017
<211> 9
<212> PRT
<213> Homo sapiens

<400> 4017

Gly Pro Pro Met Met Arg Pro Pro Ala
1 5

<210> 4018
<211> 10
<212> PRT
<213> Homo sapiens

<400> 4018

Gly Pro Pro Arg Pro Gly Met Met Pro Ala
1 5 10

<210> 4019
<211> 8
<212> PRT
<213> Homo sapiens

<400> 4019

His Asp Ser Pro Ser Val Arg Lys
1 5

<210> 4020
<211> 8
<212> PRT
<213> Homo sapiens

<400> 4020

Lys Asp Tyr Tyr Gln Lys Trp Met
1 5

<210> 4021
<211> 8
<212> PRT
<213> Homo sapiens

<400> 4021

Lys Ile Pro Pro Thr Pro Phe Ser
1 5

<210> 4022

<211> 30
<212> PRT
<213> Homo sapiens

<400> 4022

Leu Ala Leu Val Phe Glu Ala Pro Asn Gln Glu Lys Val Ser Asp Tyr
1 5 10 15

Glu Met Lys Leu Met Asp Leu Asp Val Glu Gln Leu Gly Ile
20 25 30

<210> 4023
<211> 7
<212> PRT
<213> Homo sapiens

<400> 4023

Met Glu Arg Lys Arg Arg Glu
1 5

<210> 4024
<211> 8
<212> PRT
<213> Homo sapiens

<400> 4024

Pro Phe Ser Ala Pro Pro Pro Ala
1 5

<210> 4025
<211> 7
<212> PRT
<213> Human herpesvirus

<400> 4025

Pro Pro Pro Gly Arg Arg Pro
1 5

<210> 4026
<211> 9
<212> PRT
<213> Homo sapiens

<400> 4026

Pro Pro Pro Pro Gly Met Met Pro Val
1 5

<210> 4027
<211> 8
<212> PRT
<213> Homo sapiens

<400> 4027

Pro Pro Pro Pro Ser Leu Pro Gly
1 5

<210> 4028
<211> 32
<212> PRT
<213> Homo sapiens

<400> 4028

Arg Glu Arg Arg Arg Ser His Arg Ser Glu Arg Glu Arg Arg Arg Asp
1 5 10 15

Arg Asp Arg Asp Arg Asp Arg Asp Arg Glu His Lys Arg Gly Glu Arg
20 25 30

<210> 4029
<211> 10
<212> PRT
<213> Homo sapiens

<400> 4029

Arg Lys Thr His Cys Ser Gly Arg Lys His
1 5 10

<210> 4030
<211> 10
<212> PRT
<213> Homo sapiens

<400> 4030

Thr Arg Pro Gly Met Thr Arg Pro Asp Arg
1 5 10

<210> 4031
<211> 20
<212> PRT
<213> Mus musculus

<400> 4031

Tyr Tyr Cys Ala Arg Phe Leu Trp Glu Pro Tyr Ala Met Asp Tyr Trp
1 5 10 15

Gly Gln Gly Ser
20

<210> 4032
<211> 34
<212> PRT
<213> Homo sapiens

<400> 4032

Ala Val Ala Ala Thr Ala Ser Ile Ala Gly Ala Pro Thr Gln Tyr Pro
1 5 10 15

Pro Gly Arg Gly Thr Pro Pro Pro Pro Val Gly Arg Ala Thr Pro Pro
20 25 30

Pro Gly

<210> 4033
<211> 13
<212> PRT
<213> Homo sapiens

<400> 4033

Gly Ile Met Ala Pro Pro Pro Gly Met Arg Pro Pro Met
1 5 10

<210> 4034
<211> 22
<212> PRT
<213> Homo sapiens

<400> 4034

Gly Val Gly Gly Pro Ser Gln Gln Val Met Thr Pro Gln Gly Arg Gly
1 5 10 15

Thr Val Ala Ala Ala Ala
20

<210> 4035
<211> 11
<212> PRT
<213> Homo sapiens

<400> 4035

Met Gly Pro Pro Ile Gly Leu Pro Pro Ala Arg
1 5 10

<210> 4036
<211> 32
<212> PRT
<213> Homo sapiens

<400> 4036

Arg Gly Thr Pro Ile Gly Met Pro Pro Pro Gly Met Arg Pro Pro Pro
1 5 10 15

Pro Gly Ile Arg Gly Pro Pro Pro Pro Gly Met Arg Pro Pro Arg Pro

20 25 30

<210> 4037
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4037

Glu Ala Leu Lys Lys Ile Ile Glu Asp Gln Gln Glu Ser Leu Asn Lys
1 5 10 15

Trp Lys Ser Lys
20

<210> 4038
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4038

Glu Thr Pro Gly Gln Lys Tyr Lys Glu Thr Asp Leu Leu Ile Leu Phe
1 5 10 15

Lys Asp Asp Tyr
20

<210> 4039
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4039

Phe Ser Asn His Gly Glu Ile Lys Trp Ile Asp Phe Val Arg Gly Ala
1 5 10 15

Lys Glu Gly Ile
20

<210> 4040
<211> 6
<212> PRT
<213> Homo sapiens

<400> 4040

Gly Leu Glu Leu Pro Glu
1 5

<210> 4041
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4041

His Pro Met Leu Pro Asn Tyr Lys Asn Phe Lys Gly Thr Ile Gln Glu
1 5 10 15

Leu Gly Gln Asn
20

<210> 4042
<211> 6
<212> PRT
<213> Bos taurus

<400> 4042

Ile Arg Gly Glu Arg Ala
1 5

<210> 4043
<211> 4
<212> PRT
<213> Homo sapiens

<400> 4043

Lys Ile Arg Tyr
1

<210> 4044
<211> 4
<212> PRT
<213> Homo sapiens

<400> 4044

Lys Lys Ile Lys
1

<210> 4045
<211> 4
<212> PRT
<213> Homo sapiens

<400> 4045

Lys Asn Asp Lys
1

<210> 4046
<211> 4
<212> PRT
<213> Homo sapiens

<400> 4046

Leu Asp Lys Lys

1

<210> 4047
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4047

Leu Ile Leu Phe Lys Asp Asp Tyr Phe Ala Lys Lys Asn Glu Glu Arg
1 5 10 15

Lys Gln Asn Lys
20

<210> 4048
<211> 12
<212> PRT
<213> Homo sapiens

<400> 4048

Asn Gly Asn Leu Gln Leu Arg Asn Lys Glu Val Thr
1 5 10

<210> 4049
<211> 5
<212> PRT
<213> Homo sapiens

<400> 4049

Pro Ile Val Glu Thr
1 5

<210> 4050
<211> 7
<212> PRT
<213> Homo sapiens

<400> 4050

Gln Phe Ile Gly Tyr Pro Ile
1 5

<210> 4051
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4051

Ser Asp Tyr Lys Ser Ala His Lys Gly Phe Lys Gly Val Asp Ala Gln
1 5 10 15

Gly Thr Leu Ser

20

<210> 4052
<211> 5
<212> PRT
<213> Homo sapiens

<400> 4052

Ser Lys Glu Gln Val
1 5

<210> 4053
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4053

Val Arg Gly Ala Lys Glu Gly Ile Ile Leu Phe Lys Glu Lys Ala Lys
1 5 10 15

Glu Ala Leu Gly
20

<210> 4054
<211> 10
<212> PRT
<213> Homo sapiens

<400> 4054

Glu Trp Glu Asp Thr Tyr Gly Ile Val Leu
1 5 10

<210> 4055
<211> 10
<212> PRT
<213> Staphylococcus aureus

<400> 4055

Glu Trp Glu Ser Thr Tyr Ser Ile Leu Gly
1 5 10

<210> 4056
<211> 50
<212> PRT
<213> Homo sapiens

<400> 4056

Gly Tyr Gly Lys Ile Asn Lys Lys Arg Ile Ala Leu Thr Asp Asn Ala
1 5 10 15

Leu Ile Ala Arg Ser Leu Gly Lys Tyr Gly Ile Ile Cys Met Glu Asp

20 25 30

Leu Ile His Glu Ile Tyr Thr Val Gly Lys Arg Phe Lys Glu Ala Asn
35 40 45

Asn Phe
50

<210> 4057
<211> 23
<212> PRT
<213> Homo sapiens

<400> 4057

Lys Met Leu Lys Asn Arg Glu Pro Val Gln Leu Glu Thr Leu Ser Ile
1 5 10 15

Arg Gly Asn Arg Ile Arg Tyr
20

<210> 4058
<211> 10
<212> PRT
<213> Human herpesvirus

<400> 4058

Leu Trp Asp Gln Thr Tyr Gly Val Pro Asp
1 5 10

<210> 4059
<211> 25
<212> PRT
<213> Homo sapiens

<400> 4059

Pro Ala Val Pro Glu Thr Leu Lys Lys Lys Arg Arg Asn Phe Ala Glu
1 5 10 15

Leu Lys Ile Lys Arg Leu Arg Lys Lys
20 25

<210> 4060
<211> 19
<212> PRT
<213> Homo sapiens

<400> 4060

Arg Met Ala Arg Met Ala Arg Lys Ala Gly Asn Phe Tyr Val Pro Ala
1 5 10 15

Glu Pro Lys

<210> 4061
<211> 10
<212> PRT
<213> Human immunodeficiency virus

<400> 4061

Thr Trp Asn Asp Thr Tyr Gly Ser Asn Asn
1 5 10

<210> 4062
<211> 10
<212> PRT
<213> Homo sapiens

<400> 4062

Thr Tyr Gly Ile Val Leu Leu Ser Gly Val
1 5 10

<210> 4063
<211> 14
<212> PRT
<213> Bos taurus

<400> 4063

Ala Leu Gln Glu Ala Cys Glu Ala Tyr Leu Val Gly Leu Phe
1 5 10

<210> 4064
<211> 11
<212> PRT
<213> Trypanosoma cruzi

<400> 4064

Glu Asp Asp Asp Met Gly Phe Gly Leu Phe Asp
1 5 10

<210> 4065
<211> 21
<212> PRT
<213> Homo sapiens

<400> 4065

Gly Gly Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
1 5 10 15

Gly Gly Gly Ser Ser
20

<210> 4066
<211> 18
<212> PRT
<213> Bos taurus

<400> 4066

Arg Phe Gln Ser Ser Ala Val Met Ala Leu Gln Glu Ala Cys Glu Ala
1 5 10 15

Tyr Leu

<210> 4067
<211> 11
<212> PRT
<213> Homo sapiens

<400> 4067

Thr Phe Ile Gln Phe Lys Lys Asp Leu Lys Glu
1 5 10

<210> 4068
<211> 21
<212> PRT
<213> Bos taurus

<400> 4068

Ala Arg Thr Lys Gln Thr Ala Arg Lys Ser Thr Gly Gly Lys Ala Pro
1 5 10 15

Arg Lys Gln Leu Ala
20

<210> 4069
<211> 16
<212> PRT
<213> Bos taurus

<400> 4069

Ala Val Thr Tyr Thr Glu His Ala Lys Arg Lys Thr Val Thr Ala Met
1 5 10 15

<210> 4070
<211> 18
<212> PRT
<213> Bos taurus

<400> 4070

Gly Ala Gly Ala Pro Val Tyr Leu Ala Ala Val Leu Glu Tyr Leu Thr
1 5 10 15

Ala Glu

<210> 4071
<211> 7
<212> PRT
<213> Escherichia coli

<400> 4071

Ile Leu Pro Pro Pro Gly Tyr
1 5

<210> 4072
<211> 20
<212> PRT
<213> Bos taurus

<400> 4072

Ile Gln Thr Ala Val Arg Leu Leu Leu Pro Gly Glu Leu Ala Lys His
1 5 10 15

Ala Val Ser Glu
20

<210> 4073
<211> 15
<212> PRT
<213> Bos taurus

<400> 4073

Lys Gln Leu Ala Thr Lys Ala Ala Arg Lys Ser Ala Pro Ala Thr
1 5 10 15

<210> 4074
<211> 21
<212> PRT
<213> Bos taurus

<400> 4074

Leu Ala Gly Asn Ala Ala Arg Asp Asn Lys Lys Thr Arg Ile Ile Pro
1 5 10 15

Arg His Leu Gln Leu
20

<210> 4075
<211> 16
<212> PRT
<213> Bos taurus

<400> 4075

Leu Ala Ile Arg Asn Asp Glu Glu Leu Asn Lys Leu Leu Gly Lys Val
1 5 10 15

<210> 4076
<211> 14
<212> PRT
<213> Bos taurus

<400> 4076

Leu Pro Lys Lys Thr Glu Ser His His Lys Ala Lys Gly Lys
1 5 10

<210> 4077
<211> 15
<212> PRT
<213> Bos taurus

<400> 4077

Met Ser Gly Arg Gly Lys Gln Gly Gly Lys Ala Arg Ala Lys Ala
1 5 10 15

<210> 4078
<211> 16
<212> PRT
<213> Bos taurus

<400> 4078

Pro Ala Thr Gly Gly Val Lys Lys Pro His Arg Tyr Arg Pro Gly Thr
1 5 10 15

<210> 4079
<211> 16
<212> PRT
<213> Bos taurus

<400> 4079

Arg Tyr Arg Pro Gly Thr Val Ala Leu Arg Glu Ile Arg Arg Tyr Gln
1 5 10 15

<210> 4080
<211> 7
<212> PRT
<213> Mus musculus

<400> 4080

Ser Pro Leu Asn Val Leu Met
1 5

<210> 4081
<211> 7
<212> PRT
<213> Human herpesvirus

<400> 4081

Ser Pro Pro Glu Trp Leu Lys
1 5

<210> 4082
<211> 16
<212> PRT
<213> Bos taurus

<400> 4082

Val His Pro Asp Thr Gly Ile Ser Ser Lys Ala Met Gly Ile Met Asn
1 5 10 15

<210> 4083
<211> 15
<212> PRT
<213> Bos taurus

<400> 4083

Val Ser Glu Gly Thr Lys Ala Val Thr Lys Tyr Thr Ser Ser Lys
1 5 10 15

<210> 4084
<211> 8
<212> PRT
<213> Homo sapiens

<400> 4084

Ala Asp Gly Lys Lys Ile Asp Gly
1 5

<210> 4085
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Ala Ile Ala Leu Arg Glu Tyr Arg
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Ala Ile Cys Ser Gln Cys Ser Asp
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Ala Lys Ala Lys Ala Lys Ala Lys
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Ala Leu Ala Val Thr Lys Tyr Lys Gln Arg Asn Gly Trp Ser His Lys
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Ala Leu Phe Ala Pro Arg Asp Pro
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Ala Ser Ala Ala Arg Leu Thr Met Met Trp
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Ala Val Glu Lys Val Lys Arg Thr Lys Asp Glu
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Asp Val Glu Pro Lys Val Lys Ser Lys Lys Arg Glu Ala Val Ala Gly
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Glu Lys Asp Ser Tyr Val Val Ala Phe Ser Asp Glu Met Val Pro Cys
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Pro Val Thr Thr Asp Met
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Glu Arg Met Glu Arg Lys Arg Arg Glu Lys
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Phe Thr Phe Ile Gln Phe Lys Lys Asp Leu Lys Glu Ser Met Lys
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Gly Thr Gln Val His Gly Thr Ile
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His Pro Ala Ile Ala Leu Arg Glu
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Ile Ala Leu Arg Glu Tyr Arg Lys
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Ile Leu Pro Asp Ser Leu Pro Leu
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Lys Asp Lys Asp Arg Asp Arg Lys Arg Arg Ser Ser Arg Ser Arg
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Lys Lys Ala Lys Ala Lys Ala Lys
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Lys Lys Ala Pro Ala Lys Lys Gly Glu Lys Val Pro Lys Gly Lys
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Lys Lys Lys Lys
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Leu Phe Lys Pro Pro Lys Tyr His Pro Asp Val Pro Tyr Val Lys Arg
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Leu Leu Val Asp Val Glu Pro Lys
1 5

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Leu Pro Met Ile Trp Ala Gln Lys Thr Asn Thr Pro
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Leu Arg Lys Phe Lys Asn Ile Ser Tyr Phe Pro Gly Lys Leu Arg
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Leu Thr Ala Leu Leu Arg Asn Leu
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Ala Asn Ser Gln Asp Gly
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Met Pro Leu Thr Ala Leu Leu Arg
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Asn Thr His Leu Lys Ala Val Lys Met Thr Leu Lys Asn Arg
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Pro Ala Ile Ala Leu Arg Glu Tyr
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Pro Leu Thr Ala Leu Leu Arg Asn
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Gln Arg Arg Ser Ala Arg Leu Ser Ala Lys Pro Ala Pro Pro Lys
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Arg Ala Arg Ala Arg Ala Arg Ala
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Arg Glu Ala Val Ala Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly
1 5 10 15

Arg Gly Arg Gly Arg Gly Arg Gly Gly Pro Arg Arg
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Arg Phe Leu Met Lys Leu Ser His
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Arg Arg Ser His Arg Ser Glu Arg
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Arg Arg Ser Arg Ser Arg Asp Lys
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Ser Glu Gly Leu Ala Ile Val Thr
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Ser Lys Leu Ile Lys Ile Phe Gln Asp His Pro Leu Gln Lys Thr Tyr
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Asn

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Ser Arg Glu Arg Ser Lys Asp Lys
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<400> 4127

Thr Ala Leu Leu Arg Asn Leu Gly
1 5

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Thr Leu Lys Asn Arg Glu Pro Val
1 5

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Thr Tyr Lys Thr Gly His Gly Leu Arg Gly Lys Leu Lys Trp Arg Pro
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Val Glu Arg Gly Arg Thr Val Lys
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Val His Pro Ala Ile Ala Leu Arg
1 5

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Val Lys Gly Trp Arg Pro Arg Arg
1 5

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

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Gly Ile Thr Lys Pro Ala Ile Arg Arg Ile Ala Arg Arg Gly Gly
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Gly Lys Gly Gly Lys Gly Leu Gly Lys Gly Gly Ala Lys Arg His
1 5 10 15

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Gly Lys Gly Leu Gly Lys Gly Gly Ala Lys Arg His Arg Lys Val
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Ile Met Met Ser Phe Val Asn Asp Ile Phe Glu Arg Ile Ala Gly
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Ile Arg Arg Ile Ala Arg Arg Gly Gly Val Lys Arg Ile Ser Gly
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Ile Ser Gly Leu Ile Tyr Glu Glu Thr Arg Gly Val Leu Lys Val
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Lys Pro Ala Ile Arg Arg Ile Ala Arg Arg Gly Gly Val Lys Arg
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Pro Ala Ile Arg Arg Ile Ala Arg
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Leu Gly Lys Gly Gly Ala Lys Arg His Arg Lys Val Leu Arg Asp
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Leu Lys Val Phe Leu Glu Asn Val Ile Arg Asp Ala Val Thr Tyr
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Asn Asp Ile Phe Glu Arg Ile Ala Gly Glu Ala Ser Arg Leu Ala
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Asn Val Ile Arg Asp Ala Val Thr Tyr Thr Glu His Ala Lys Arg
1 5 10 15

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Pro Glu Pro Ala Lys Ser Ala Pro Ala Pro Lys Lys Gly Ser Lys
1 5 10 15

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Pro Lys Lys Gly Ser Lys Lys Ala Val Thr Lys Ala Gln Lys Lys Asp
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Gly Lys Lys Arg Lys Arg Ser Arg
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Gln Lys Lys Asp Gly Lys Lys Arg Lys Arg Ser Arg Lys Glu Ser
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Arg Asp Ala Val Thr Tyr Thr Glu His Ala Lys Arg Lys Thr Val
1 5 10 15

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

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Ser Gly Arg Gly Lys Gly Gly Lys Gly Leu Gly Lys Gly Gly Ala
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Ser Arg Glu Ile Gln Thr Ala Val Arg Leu Leu Leu Pro Gly Glu
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Tyr Ala Leu Lys Arg Gln Gly Arg Thr Leu Tyr Gly Phe Gly Gly
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Ala Ala Phe Gln Gln Gly Lys Ile Pro Pro
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Ala Met Pro Pro Gln Gln Leu Met
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Ala Pro Gly Met Arg Pro Pro Met Gly Gly
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Ala Thr Lys Lys Ala Val Gln Gly
1 5

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Glu Val Arg Leu Val Pro Gly Arg
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Phe Gln Gln Gly Lys Ile Pro Pro Thr Pro
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Gly Ala Met Pro Pro Gln Gln Leu
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Gly Met Ile Pro Pro Pro Gly Leu
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Gly Met Pro Pro Met Thr Gln Ala
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Gly Pro Ala Pro Gly Met Arg Pro Pro Met
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Gly Gln Pro Pro Tyr Met Pro Pro
1 5

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Ile Gly Thr Phe Lys Ala Phe Asp
1 5

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Ile Pro Pro Gly Ala Met Pro Pro
1 5

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Ile Pro Pro Pro Gly Leu Ala Pro
1 5

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Lys Pro Lys Ser Gln Glu Thr Pro
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Met Ile Pro Pro Pro Gly Leu Ala
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Met Pro Pro Met Thr Gln Ala Pro
1 5

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Met Pro Pro Pro Gly Met Ile Pro
1 5

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Met Pro Pro Gln Gln Leu Met Pro
1 5

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Met Thr Gln Ala Pro Arg Ile Met
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Pro Ala Thr Lys Lys Ala Val Gln
1   5

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Pro Gly Ala Met Pro Pro Gln Gln
1   5

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Pro Gly Met Ile Pro Pro Pro Gly
1   5

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Pro Met Thr Gln Ala Pro Arg Ile
1   5

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Pro Pro Ala Gln Pro Leu Ser Glu
1   5

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Pro Pro Gly Ala Met Pro Pro Gln
1 5

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Pro Pro Gly Met Ile Pro Pro Pro
1 5

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Pro Pro Met Thr Gln Ala Pro Arg
1 5

<210> 4189
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Pro Pro Pro Gly Leu Ala Pro Gly
1 5

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Pro Pro Gln Gln Leu Met Pro Gly
1 5

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Pro Pro Tyr Met Pro Pro Pro Gly
1 5

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Pro Val Gly Pro Ala Pro Gly Met Arg Pro
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Pro Tyr Met Pro Pro Pro Gly Met
1 5

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Gln Pro Pro Tyr Met Pro Pro Pro
1 5

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Arg Gly Val Gly Gly Pro Ser Gln
1 5

<210> 4196
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Thr Pro Ala Thr Lys Lys Ala Val
1 5

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Tyr Met Pro Pro Pro Gly Met Ile
1 5

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Arg Arg Glu Phe Glu Val Tyr Gly Pro Ile Lys Arg Ile His Met Val
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Tyr Ser Lys Arg Ser Gly Lys Pro Arg Gly Tyr Ala Phe Ile Glu Tyr
20 25 30

Glu His Glu Arg Asp Met His Ser
35 40

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<400> 4199

Lys Ile Leu Gly Asn Gln Gly Ser Phe Leu Thr Lys Gly Pro Ser Lys
1 5 10 15

Leu

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<400> 4200

Thr Tyr Ile Cys Glu Val Glu Asp Gln Lys Glu Glu
1 5 10

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Ala Glu Ile Glu Thr Asp Lys Ala Thr Ile Gly Phe Glu Val Gln Glu
1 5 10 15

Glu Gly

<210> 4202

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Gly Leu Lys Lys Met Leu Arg Thr Cys Ala Val His Ile Thr Leu
1 5 10 15

<210> 4203
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Ser Ala Pro Ala Thr Gly Gly Val Lys Lys Pro His Arg Tyr Arg Pro
1 5 10 15

Gly Thr

<210> 4204
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<400> 4204

Ala Gly Ala Gly Arg Val Arg Thr Ser Ala Arg Ala Gly Ser Thr
1 5 10 15

<210> 4205
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<400> 4205

Ala Pro Ala Pro Arg Thr Arg Tyr Pro Thr Arg Ala Pro Ser Gly
1 5 10 15

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<400> 4206

Ala Thr Ala Arg Arg Lys Arg Arg Trp Ala Thr Arg Gly Pro Ala
1 5 10 15

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<400> 4207

Ala Val Leu Arg Ala Pro Gln Asn Pro Pro Pro Pro Gly Pro Gln
1 5 10 15

<210> 4208
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<400> 4208

Cys Ala Gly Trp Ala Leu Trp Arg Cys Ala Leu Arg Trp Ala Glu
1 5 10 15

<210> 4209
<211> 15
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<213> Torque teno virus

<400> 4209

Asp Glu Tyr Lys Arg Phe Met Asn Tyr Trp Thr Ala Ser Asn Glu
1 5 10 15

<210> 4210
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<213> Human herpesvirus

<400> 4210

Asp Pro Val Gly His Pro Ala Ala Pro Arg Ala Pro Gly Pro Glu
1 5 10 15

<210> 4211
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<213> Torque teno virus

<400> 4211

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

<210> 4212
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<400> 4212

Asp Arg Arg Arg Glu Gly Pro Asp Arg Ser Pro Arg Gln Pro Pro
1 5 10 15

<210> 4213
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<212> PRT
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<400> 4213

Gly Pro Asp Arg Ser Pro Arg Gln Pro Pro Val Leu Pro Ala Ala
1 5 10 15

<210> 4214
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<212> PRT
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<400> 4214

Gly Pro Gly Ala Gly Asp Arg Arg Arg Glu Gly Pro Asp Arg Ser
1 5 10 15

<210> 4215
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<212> PRT
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<400> 4215

His Pro Ala Phe Ala Arg Ala His Gly Glu Ala Gly Ala Gly Arg
1 5 10 15

<210> 4216
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<400> 4216

His Arg Ala Leu Ala Arg Gly Pro Pro Ala Arg Leu Gly Gly Glu
1 5 10 15

<210> 4217
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<213> Homo sapiens

<400> 4217

Lys Arg Arg Trp Ala Thr Arg Gly Pro Ala His Pro Ala Phe Ala
1 5 10 15

<210> 4218
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<212> PRT
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<400> 4218

Leu Arg Trp Ala Glu Arg Gln Val Gly Ala Leu Gly Ala Glu Ser
1 5 10 15

<210> 4219
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<400> 4219

Leu Trp Arg Cys Ala Leu Arg Trp Ala Glu Arg Gln Val Gly Ala
1 5 10 15

<210> 4220
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<400> 4220

Pro Gln Asp Pro Arg Ser Pro Gly Pro Ala Pro Arg His Arg Arg
1 5 10 15

<210> 4221
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<400> 4221

Pro Arg Ala Pro Pro Ala Arg Ala Ser Tyr Arg Arg Phe Arg Thr
1 5 10 15

<210> 4222
<211> 15
<212> PRT
<213> Human herpesvirus

<400> 4222

Pro Arg His Gly His Ser Gln Gly Pro Trp Lys Pro Trp Ser Ala
1 5 10 15

<210> 4223
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<212> PRT
<213> Homo sapiens

<400> 4223

Pro Arg His Arg His Pro Gln Asp Pro Arg Ser Pro Gly Pro Ala
1 5 10 15

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<400> 4224

Pro Arg His Arg Arg Pro Pro Arg Pro Asp Pro Arg Ala Pro Pro
1 5 10 15

<210> 4225
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<213> Torque teno virus

<400> 4225

Pro Arg Ser Arg His Pro Gly Gly Pro Gly Thr Pro Gln Ile Arg
1 5 10 15

<210> 4226
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<213> Human adenovirus

<400> 4226

Pro Ser Arg Arg Arg Arg Arg Lys Ala Thr Leu Ala Pro Ala
1 5 10 15

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<400> 4227

Arg Ala His Gly Glu Ala Gly Ala Gly Arg Val Arg Thr Ser Ala
1 5 10 15

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Arg Ala Pro Ser Gly Pro Arg Pro Pro Ser Arg Ser Gln Ala Gln
1 5 10 15

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<400> 4229

Arg Leu Gly Gly Glu Gly Pro Gly Ala Gly Asp Arg Arg Arg Glu
1 5 10 15

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<400> 4230

Arg Leu Ser Pro Gly His Arg Ala Leu Ala Arg Gly Pro Pro Ala
1 5 10 15

<210> 4231
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<213> Human herpesvirus

<400> 4231

Arg Val Pro Arg Ile Pro Arg Asp Pro Arg Pro Pro Arg Pro Pro
1 5 10 15

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Ser Pro Gly Pro Ala Pro Arg His Arg Arg Pro Pro Arg Pro Asp
1 5 10 15

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<400> 4233

Ser Trp Glu Arg Arg Arg Leu Ser Pro Gly His Arg Ala Leu Ala
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<400> 4234

Thr Leu Arg Pro Ala Ala Thr Ala Arg Arg Lys Arg Arg Trp Ala
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Thr Pro Pro Arg Ser Val Pro Arg Leu Arg Pro Arg His Arg His
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Thr Arg Gly Pro Ala His Pro Ala Phe Ala Arg Ala His Gly Glu
1 5 10 15

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<400> 4237

Val Ala Ser Arg Pro Leu Phe Pro Pro Arg Ser Pro Gly Pro Ser
1 5 10 15

<210> 4238
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<400> 4238

Val Pro Arg Leu Arg Pro Arg His Arg His Pro Gln Asp Pro Arg
1 5 10 15

<210> 4239
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<213> Torque teno virus

<400> 4239

Trp Trp Ala Arg Arg Arg Arg Arg Trp Arg Arg Trp Lys Arg Arg
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<400> 4240

Ala Lys Lys Gly Glu Lys Val Pro Lys Gly Lys Lys Gly Lys Ala
1 5 10 15

<210> 4241
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<400> 4241

Ala Lys Pro Ala Pro Pro Lys Pro Glu Pro Lys Pro Lys Lys Ala
1 5 10 15

<210> 4242
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<400> 4242

Ala Arg Leu Ser Ala Lys Pro Ala Pro Pro Lys Pro Glu Pro Lys
1 5 10 15

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Glu Lys Val Pro Lys Gly Lys Lys Gly Lys Ala Asp Ala Gly Lys
1 5 10 15

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<400> 4244

Glu Pro Lys Pro Lys Lys Ala Pro Ala Lys Lys Gly Glu Lys Val
1 5 10 15

<210> 4245
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<213> Human herpesvirus

<400> 4245

Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Gly Arg Gly
1 5 10

<210> 4246
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<400> 4246

Ile Lys Lys Val Ala Thr Pro Lys Lys Ala Ser Pro Lys Lys
1 5 10

<210> 4247
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<400> 4247

Lys Asp Glu Pro Gln Arg Arg Ser Ala Arg Leu Ser Ala Lys Pro
1 5 10 15

<210> 4248
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<400> 4248

Lys Ser Pro Lys Lys Ala Lys Ala Ala Lys Pro Lys Lys Ala Pro
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<220>
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Lys Thr Pro Lys Lys Ala Lys Lys Pro Lys Thr Pro Lys Lys Ala
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<400> 4250

Pro Lys Lys Ser Ala Lys Lys Thr Pro Lys Lys Ala Lys Lys Pro
1 5 10 15

<210> 4251
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Pro Lys Arg Lys Ala Glu Gly Asp Ala Lys Gly Asp Lys Ala Lys
1 5 10 15

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

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Ala Ala Ala Pro Val Ala Ala Ala Thr Thr Ala Ala Pro Ala Ala
1 5 10 15

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Ala Ala Lys Pro Lys Thr Ala Lys Pro Lys Ala Ala Lys Pro Lys Lys
1 5 10 15

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Ala Ala Pro Ala Lys Val Glu Ala Lys Glu Glu Ser Glu Glu Ser
1 5 10 15

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Ala Glu Glu Lys Lys Val Glu Ala Lys Lys Glu Glu Ser Glu Glu

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Ala Phe Asp Lys His Met Asn Leu
1 5

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Ala Gly Ala Ala Lys Arg Lys Ala Ser Gly Pro Pro Val Ser Glu Leu
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Ala Gly Gly Pro Ala Pro Ala Ala Gly Ala Ala Pro Ala Gly Gly
1 5 10 15

<210> 4262
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<400> 4262

Ala Lys Lys Ala Gly Ala Ala Lys Ala Lys Lys Pro Ala Gly Ala Ala
1 5 10 15

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<400> 4263

Ala Leu Leu Arg Asn Leu Gly Lys
1 5

<210> 4264
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<212> PRT
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<400> 4264

Ala Leu Arg Glu Tyr Arg Lys Lys
1 5

<210> 4265
<211> 15
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<400> 4265

Ala Pro Ala Ala Gly Ala Ala Pro Ala Gly Gly Pro Ala Pro Ser
1 5 10 15

<210> 4266
<211> 16
<212> PRT
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<400> 4266

Ala Pro Lys Ser Pro Ala Lys Ala Lys Ala Val Lys Pro Lys Ala Ala
1 5 10 15

<210> 4267
<211> 15
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<400> 4267

Ala Pro Ser Thr Ala Ala Ala Pro Ala Glu Glu Lys Lys Val Glu
1 5 10 15

<210> 4268
<211> 16
<212> PRT
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<400> 4268

Ala Thr Pro Lys Lys Ser Ala Lys Lys Thr Pro Lys Lys Ala Lys Lys
1 5 10 15

<210> 4269
<211> 8
<212> PRT
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<400> 4269

Ala Thr Pro Pro Pro Gly Ile Met
1 5

<210> 4270
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<212> PRT
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<400> 4270

Cys Asp Glu Phe Arg Lys Ile Lys
1 5

<210> 4271
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<400> 4271

Cys Asn Val Gly Ala Gly Gly Pro Ala Pro Ala Ala Gly Ala Ala
1 5 10 15

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<400> 4272

Asp Asn Val Gly Ser Lys Gln Met Gln Gln Ile Arg Met Ser Leu
1 5 10 15

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<400> 4273

Asp Arg Ala Thr Trp Lys Ser Asn Tyr Phe Leu Lys Ile Ile Gln
1 5 10 15

<210> 4274
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<400> 4274

Asp Arg Leu Asn Lys Val Ile Ser Glu Leu Asn Gly Lys Asn Ile
1 5 10 15

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<400> 4275

Asp Val Gln Leu Ile Lys Thr Gly Asp Lys Val Gly Ala Ser Glu
1 5 10 15

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Glu Ala Asp Asp Asp Arg Leu Asn Lys Val Ile Ser Glu Leu Asn
1 5 10 15

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<400> 4277

Glu Asp Lys Ile Asn Ala Leu Ile Lys Ala Ala Gly Val Asn Val
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<400> 4278

Glu Gly Pro Pro Pro Lys Asp Thr
1 5

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<400> 4279

Glu Ile Leu Ser Asp Val Gln Leu Ile Lys Thr Gly Asp Lys Val
1 5 10 15

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<400> 4280

Glu Lys Lys Glu Glu Ser Glu Glu Ser Asp Asp Asp Met Gly Phe
1 5 10 15

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<211> 16
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<400> 4281

Glu Lys Thr Pro Val Lys Lys Lys Ala Arg Lys Ser Ala Gly Ala Ala
1 5 10 15

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<400> 4282

Glu Lys Thr Ser Phe Phe Gln Ala Leu Gly Ile Thr Thr Lys Ile
1 5 10 15

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<212> PRT
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<400> 4283

Glu Leu Asn Gly Lys Asn Ile Glu Asp Val Ile Ala Gln Gly Ile
1 5 10 15

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<400> 4284

Glu Ser Glu Glu Ser Asp Glu Asp Met Gly Phe Gly Leu Phe Asp
1 5 10 15

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<400> 4285

Glu Tyr Arg Lys Lys Met Asp Ile
1 5

<210> 4286
<211> 15
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<213> Homo sapiens

<400> 4286

Phe Phe Gln Ala Leu Gly Ile Thr Thr Lys Ile Ser Arg Gly Thr
1 5 10 15

<210> 4287
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<212> PRT
<213> Homo sapiens

<400> 4287

Phe Lys Ala Phe Asp Lys His Met
1 5

<210> 4288
<211> 15
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<400> 4288

Gly Ala Val Ala Val Ser Ala Ala Pro Gly Ser Ala Ala Pro Ala
1 5 10 15

<210> 4289
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<212> PRT
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<400> 4289

Gly Gly Asn Ser Ser Pro Ser Ala Lys Asp Ile Lys Lys Ile Leu
1 5 10 15

<210> 4290
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<212> PRT
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<400> 4290

Gly Lys Ala Val Val Leu Met Gly Lys Asn Thr Met Met Arg Lys
1 5 10 15

<210> 4291
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<400> 4291

Gly Leu Gly Pro Glu Lys Thr Ser Phe Phe Gln Ala Leu Gly Ile
1 5 10 15

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<400> 4292

Gly Leu Pro Pro Ala Arg Gly Thr
1 5

<210> 4293

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<400> 4293

Gly Met Pro Pro Pro Gly Met Arg
1 5

<210> 4294
<211> 8
<212> PRT
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<400> 4294

Gly Pro Pro Pro Pro Gly Met Arg
1 5

<210> 4295
<211> 15
<212> PRT
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<400> 4295

Gly Ser Leu Ile Cys Asn Val Gly Ala Gly Gly Pro Ala Pro Ala
1 5 10 15

<210> 4296
<211> 8
<212> PRT
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<400> 4296

Gly Thr Phe Lys Ala Phe Asp Lys
1 5

<210> 4297
<211> 8
<212> PRT
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<400> 4297

Ile Gly Leu Pro Pro Ala Arg Gly
1 5

<210> 4298
<211> 16
<212> PRT
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<400> 4298

Ile Lys Leu Gly Leu Lys Ser Leu Val Ser Lys Gly Thr Leu Val Gln
1 5 10 15

<210> 4299
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<212> PRT
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<400> 4299

Ile Lys Thr Gly Asp Lys Val Gly Ala Ser Glu Ala Thr Leu Leu
1 5 10 15

<210> 4300
<211> 15
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<400> 4300

Ile Gln Gln Val Phe Asp Asn Gly Ser Ile Tyr Asn Pro Glu Val
1 5 10 15

<210> 4301
<211> 8
<212> PRT
<213> Homo sapiens

<400> 4301

Ile Trp Ala Gln Lys Thr Asn Thr
1 5

<210> 4302
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4302

Lys Ala Ala Gly Val Asn Val Glu Pro Phe Trp Pro Gly Leu Phe
1 5 10 15

<210> 4303
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<212> PRT
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<400> 4303

Lys Ala Phe Asp Lys His Met Asn
1 5

<210> 4304
<211> 16
<212> PRT
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<400> 4304

Lys Ala Lys Lys Pro Ala Ala Ala Ala Gly Ala Lys Lys Ala Lys Ser
1 5 10 15

<210> 4305
<211> 15
<212> PRT
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<400> 4305

Lys Glu Glu Ser Glu Glu Ser Asp Glu Asp Met Gly Phe Gly Leu
1 5 10 15

<210> 4306
<211> 17
<212> PRT
<213> Homo sapiens

<400> 4306

Lys Glu Ile Lys Lys Val Ala Thr Pro Lys Lys Ala Ser Lys Pro Lys
1 5 10 15

Lys

<210> 4307
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4307

Lys Lys Glu Glu Ser Glu Glu Ser Asp Asp Asp Met Gly Phe Gly
1 5 10 15

<210> 4308
<211> 16
<212> PRT
<213> Homo sapiens

<400> 4308

Lys Leu Asn Lys Lys Ala Ala Ser Gly Glu Ala Lys Pro Lys Ala Lys
1 5 10 15

<210> 4309
<211> 15
<212> PRT
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<400> 4309

Lys Asn Ile Glu Asp Val Ile Ala Gln Gly Ile Gly Lys Leu Ala
1 5 10 15

<210> 4310
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<212> PRT
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<400> 4310

Lys Ser Pro Lys Lys Ala Lys Ala Ala Lys Pro Lys Lys Ala Pro Lys
1 5 10 15

<210> 4311
<211> 15
<212> PRT
<213> Gallus gallus

<400> 4311

Lys Ser Arg Lys Ala Ser Lys Ala Lys Lys Val Lys Arg Ser Lys
1 5 10 15

<210> 4312
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4312

Lys Val Glu Ala Lys Glu Glu Ser Glu Glu Ser Asp Glu Asp Met
1 5 10 15

<210> 4313
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4313

Lys Val Glu Ala Lys Lys Glu Glu Ser Glu Glu Ser Asp Asp Asp
1 5 10 15

<210> 4314
<211> 15
<212> PRT
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<400> 4314

Leu Ala Ala Leu Gly Gly Asn Ser Ser Pro Ser Ala Lys Asp Ile
1 5 10 15

<210> 4315
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<400> 4315

Leu Ala Asp Pro Ser Ala Phe Val Ala Ala Ala Pro Val Ala Ala
1 5 10 15

<210> 4316
<211> 8
<212> PRT
<213> Homo sapiens

<400> 4316

Leu Pro Pro Ala Arg Gly Thr Pro
1 5

<210> 4317
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<212> PRT
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<400> 4317

Leu Gln Glu Leu Glu Lys Asp Glu Arg Glu Gln
1 5 10

<210> 4318
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<400> 4318

Leu Arg Glu Tyr Arg Lys Lys Met
1 5

<210> 4319
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<212> PRT
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<400> 4319

Met Ala Pro Pro Pro Gly Met Arg
1 5

<210> 4320
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<212> PRT
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<400> 4320

Met Ser Leu Arg Gly Lys Ala Val Val Leu Met Gly Lys Asn Thr
1 5 10 15

<210> 4321
<211> 15
<212> PRT
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<400> 4321

Pro Ala Ala Ala Ala Ala Pro Ala Lys Val Glu Ala Lys Glu Glu
1 5 10 15

<210> 4322
<211> 16
<212> PRT
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<400> 4322

Pro Ala Gly Ala Ala Lys Lys Pro Lys Lys Ala Thr Gly Ala Ala Thr
1 5 10 15

<210> 4323
<211> 15
<212> PRT
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<400> 4323

Pro Ala Leu Glu Lys Leu Leu Pro His Ile Arg Gly Asn Val Gly
1 5 10 15

<210> 4324
<211> 8
<212> PRT
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<400> 4324

Pro Gly Arg Gly Thr Pro Pro Pro
1 5

<210> 4325
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<212> PRT
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<400> 4325

Pro Pro Ala Arg Gly Thr Pro Ile
1 5

<210> 4326
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<400> 4326

Pro Pro Gly Arg Gly Thr Pro Pro
1 5

<210> 4327

<211> 8
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<400> 4327

Pro Pro Pro Gly Ile Met Ala Pro
1 5

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Pro Thr Gln Tyr Pro Pro Gly Arg
1 5

<210> 4329
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<400> 4329

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

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<212> PRT
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<400> 4330

Gln Val Met Thr Pro Gln Gly Arg
1 5

<210> 4331
<211> 8
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<400> 4331

Arg Ala Thr Pro Pro Pro Gly Ile
1 5

<210> 4332
<211> 8
<212> PRT
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<400> 4332

Arg Glu Tyr Arg Lys Lys Met Asp
1 5

<210> 4333
<211> 8
<212> PRT
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<400> 4333

Arg Gly Thr Pro Pro Pro Pro Val
1 5

<210> 4334
<211> 8
<212> PRT
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<400> 4334

Arg Lys Lys Met Asp Ile Pro Ala
1 5

<210> 4335
<211> 8
<212> PRT
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<400> 4335

Arg Pro Pro Pro Pro Gly Ile Arg
1 5

<210> 4336
<211> 16
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<400> 4336

Arg Ser Gly Val Ser Leu Ala Ala Leu Lys Lys Ala Leu Ala Ala Ala
1 5 10 15

<210> 4337
<211> 6
<212> PRT
<213> Gallus gallus

<400> 4337

Ser His Pro Thr Tyr Ser
1 5

<210> 4338
<211> 6
<212> PRT
<213> Gallus gallus

<400> 4338

Ser His Tyr Lys Val Gly
1 5

<210> 4339
<211> 16
<212> PRT
<213> Gallus gallus

<400> 4339

Ser Lys Pro Arg Ala Lys Ser Gly Ala Arg Lys Ser Pro Lys Lys Lys
1 5 10 15

<210> 4340
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<212> PRT
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<400> 4340

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

<210> 4341
<211> 15
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<400> 4341

Ser Pro Ser Ala Lys Asp Ile Lys Lys Ile Leu Asp Ser Val Gly
1 5 10 15

<210> 4342
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<212> PRT
<213> Gallus gallus

<400> 4342

Ser Ser Arg Gln Ser Ile
1 5

<210> 4343
<211> 31
<212> PRT
<213> Gallus gallus

<400> 4343

Thr Glu Ser Leu Val Leu Ser Pro Ala Pro Ala Lys Pro Lys Arg Val
1 5 10 15

Lys Ala Ser Arg Arg Ser Ala Ser His Pro Thr Tyr Ser Glu Met
20 25 30

<210> 4344
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<400> 4344

Thr Phe Lys Ala Phe Asp Lys His
1 5

<210> 4345
<211> 8
<212> PRT
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<400> 4345

Thr Pro Pro Pro Gly Ile Met Ala
1 5

<210> 4346
<211> 15
<212> PRT
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<400> 4346

Thr Thr Ala Ala Pro Ala Ala Ala Ala Ala Pro Ala Lys Val Glu
1 5 10 15

<210> 4347
<211> 15
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<400> 4347

Thr Val Ala Ser Val Pro His Ser Ile Ile Asn Gly Tyr Lys Arg
1 5 10 15

<210> 4348
<211> 15
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<400> 4348

Val Lys Ala Phe Leu Ala Asp Pro Ser Ala Phe Val Ala Ala Ala
1 5 10 15

<210> 4349
<211> 15
<212> PRT
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<400> 4349

Val Leu Met Gly Lys Asn Thr Met Met Arg Lys Ala Ile Arg Gly
1   5   10   15

<210> 4350
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<400> 4350

Val Asn Val Glu Pro Phe Trp Pro Gly Leu Phe Ala Lys Ala Leu
1   5   10   15

<210> 4351
<211> 8
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<400> 4351

Val Arg Gly Val Gly Gly Pro Ser
1   5

<210> 4352
<211> 15
<212> PRT
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<400> 4352

Val Ser Ala Ala Pro Gly Ser Ala Ala Pro Ala Ala Gly Ser Ala
1   5   10   15

<210> 4353
<211> 16
<212> PRT
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<400> 4353

Val Ser Glu Leu Ile Thr Lys Ala Val Ala Ala Ser Lys Glu Arg Ser
1   5   10   15

<210> 4354
<211> 15
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<213> Homo sapiens

<400> 4354

Val Thr Val Thr Glu Asp Lys Ile Asn Ala Leu Ile Lys Ala Ala
1   5   10   15

<210> 4355
<211> 8
<212> PRT
<213> Homo sapiens

<400> 4355

Tyr Arg Lys Lys Met Asp Ile Pro
1 5

<210> 4356
<211> 14
<212> PRT
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<400> 4356

Phe Lys Glu Gln Phe Leu Asp Gly Asp Gly Trp Thr Ser Arg
1 5 10

<210> 4357
<211> 345
<212> PRT
<213> Homo sapiens

<400> 4357

Met Ile Ser Pro Val Leu Ile Leu Phe Ser Ser Phe Leu Cys His Val
1 5 10 15

Ala Ile Ala Gly Arg Thr Cys Pro Lys Pro Asp Asp Leu Pro Phe Ser
20 25 30

Thr Val Val Pro Leu Lys Thr Phe Tyr Glu Pro Gly Glu Glu Ile Thr
35 40 45

Tyr Ser Cys Lys Pro Gly Tyr Val Ser Arg Gly Gly Met Arg Lys Phe
50 55 60

Ile Cys Pro Leu Thr Gly Leu Trp Pro Ile Asn Thr Leu Lys Cys Thr
65 70 75 80

Pro Arg Val Cys Pro Phe Ala Gly Ile Leu Glu Asn Gly Ala Val Arg
85 90 95

Tyr Thr Thr Phe Glu Tyr Pro Asn Thr Ile Ser Phe Ser Cys Asn Thr
100 105 110

Gly Phe Tyr Leu Asn Gly Ala Asp Ser Ala Lys Cys Thr Glu Glu Gly
115 120 125

Lys Trp Ser Pro Glu Leu Pro Val Cys Ala Pro Ile Ile Cys Pro Pro
130 135 140

Pro Ser Ile Pro Thr Phe Ala Thr Leu Arg Val Tyr Lys Pro Ser Ala
145 150 155 160

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Gly Asn Asn Ser Leu Tyr Arg Asp Thr Ala Val Phe Glu Cys Leu Pro
                165                 170                 175

Gln His Ala Met Phe Gly Asn Asp Thr Ile Thr Cys Thr Thr His Gly
            180                 185                 190

Asn Trp Thr Lys Leu Pro Glu Cys Arg Glu Val Lys Cys Pro Phe Pro
        195                 200                 205

Ser Arg Pro Asp Asn Gly Phe Val Asn Tyr Pro Ala Lys Pro Thr Leu
    210                 215                 220

Tyr Tyr Lys Asp Lys Ala Thr Phe Gly Cys His Asp Gly Tyr Ser Leu
225                 230                 235                 240

Asp Gly Pro Glu Glu Ile Glu Cys Thr Lys Leu Gly Asn Trp Ser Ala
                245                 250                 255

Met Pro Ser Cys Lys Ala Ser Cys Lys Leu Pro Val Lys Lys Ala Thr
            260                 265                 270

Val Val Tyr Gln Gly Glu Arg Val Lys Ile Gln Glu Lys Phe Lys Asn
        275                 280                 285

Gly Met Leu His Gly Asp Lys Val Ser Phe Phe Cys Lys Asn Lys Glu
    290                 295                 300

Lys Lys Cys Ser Tyr Thr Glu Asp Ala Gln Cys Ile Asp Gly Thr Ile
305                 310                 315                 320

Glu Val Pro Lys Cys Phe Lys Glu His Ser Ser Leu Ala Phe Trp Lys
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Thr Asp Ala Ser Asp Val Lys Pro Cys
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Ala Thr Leu Val Cys Leu Ile
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Ala Trp His Gln Gln Gln Pro
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Glu Arg Gly Leu Arg Tyr Leu
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Glu Arg Ile Leu Thr Ile Ser
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Gly Ala Ser Val Lys Val Thr
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Gly Ala Val Thr Val Ala Trp
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Gly Ser His Thr Arg Gly Asp
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Leu Asp Thr Ile
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Leu Met Lys Ile Asn Ser Asp
1 5

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Met Lys Leu Val Arg Phe Leu Met Lys Leu Ser His Glu Thr Val Thr
1 5 10 15

Ile Glu Leu

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Pro Asp Arg Phe Ser Gly Ser
1 5

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Pro Leu Asp Thr Ile Arg Val Asp Val Glu Pro Lys Val Lys Ser Lys
1 5 10 15

Lys Arg Glu Ala
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Arg Gly Tyr Asp Ser Tyr Ala
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Ser Tyr Leu Ser Leu Thr Pro
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Ser Tyr Ser Cys Gln Val Thr
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Thr Gly Val Asp Val Ser Met Asn Thr His Leu Lys Ala Val Lys Met
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Thr Leu Lys Asn
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Gly Val Asp Val
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Trp Lys Ala Pro Ser Ser Pro
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Tyr Ala Ala Ser Ser Tyr Leu
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Tyr Cys Gln Thr Trp Gly Ser
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Tyr Asp Ser Tyr Ala Ile Ala
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Glu Val Phe Ile Ser Ala Pro Arg
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Pro Ala Lys Ser Ala Pro Ala Pro Lys Lys
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Ala Val Thr Lys Ala Gln Lys Lys Asp Gly Lys Lys Arg Lys
20 25 30

<210> 4383
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Pro Pro Pro Pro Ser Ser Pro Thr His Asp Pro Pro Asp Ser Asp Pro
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Gln Ile Pro Pro Pro
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<400> 4384

Pro Gln Ile Val Pro Glu Pro Met
1 5

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<213> Homo sapiens

<400> 4385

Pro Thr Arg Ala Pro Ser Gly Pro Arg Pro Pro Ser Arg Ser Gln Ala
1 5 10 15

Gln Thr Pro Pro Arg
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Asp Gly Pro Pro Gly Glu Leu Gly Pro Asp
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Asp Lys Glu Arg Glu Arg Arg Arg Ser Arg
1 5 10

<210> 4388
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<400> 4388

Glu Lys Ile Glu Arg Arg Gln Gln Glu Val
1 5 10

<210> 4389
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Glu Asn Gly Tyr Leu Met Glu Ala Ala Pro
1 5 10

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Glu Arg Asp Lys Glu Arg Glu Arg Arg Arg
1   5   10

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Glu Arg Pro Gly Pro Ser Pro Leu Pro His
1   5   10

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Glu Arg Ser Arg Glu Arg Asp Lys Glu Arg
1   5   10

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Gly Glu Arg Gly Ser Glu Arg Gly Arg Asp
1   5   10

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Gly Gly Gly Leu Gly Gly Thr Arg Arg Gly
1   5   10

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Ile Glu Arg Arg Gln Gln Glu Val Glu Thr
1   5   10

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Lys Glu Glu Arg Arg Arg Ser Arg Glu Arg
1 5 10

<210> 4397
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<400> 4397

Lys Met Lys Gly Thr Phe Val Glu
1 5

<210> 4398
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<400> 4398

Lys Arg Gly Glu Arg Gly Ser Glu Arg Gly
1 5 10

<210> 4399
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<400> 4399

Met Glu Arg Lys Arg Arg Glu Lys Ile Glu
1 5 10

<210> 4400
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Met Met Pro Val Gly Pro Ala Pro Gly Met
1 5 10

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Met Thr Gln Phe Leu Pro Pro Asn Leu Leu
1 5 10

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Pro Gly Met Met Pro Val Gly Pro Ala Pro
1 5 10

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Pro Gly Pro Ser Pro Leu Pro His Arg Asp
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Pro Pro Gly Glu Leu Gly Pro Asp Gly Pro
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Pro Pro Pro Gly Met Met Pro Val Gly Pro
1 5 10

<210> 4406
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<400> 4406

Pro Arg Arg Leu Gly Gly Gly Leu Gly Gly
1 5 10

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Pro Ser Pro Leu Pro His Arg Asp Arg Asp
1 5 10

<210> 4408
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Arg Glu Glu Arg Met Glu Arg Lys Arg Arg
1 5 10

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Arg Glu Arg Glu Arg Arg Glu Arg Ser Arg
1 5 10

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Arg Glu Arg Arg Glu Arg Ser Arg Glu Arg
1 5 10

<210> 4411
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<400> 4411

Arg Lys Arg Arg Glu Lys Ile Glu Arg Arg
1 5 10

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<400> 4412

Arg Leu Gly Gly Gly Leu Gly Gly Thr Arg
1 5 10

<210> 4413
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<400> 4413

Arg Arg Glu Lys Ile Glu Arg Arg Gln Gln
1 5 10

<210> 4414
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<400> 4414

Arg Arg Glu Arg Ser Arg Glu Arg Asp Lys
1 5 10

<210> 4415
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<400> 4415

Ser Arg Glu Arg Asp Lys Glu Arg Glu Arg
1 5 10

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Ser Arg Tyr Asp Glu Arg Pro Gly Pro Ser
1 5 10

<210> 4417
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Tyr Asp Glu Arg Pro Gly Pro Ser Pro Leu
1 5 10

<210> 4418
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Ser Thr Asp His Pro Lys Tyr Ser Asp Met Ile Val Ala Ala Ile Gln
1 5 10 15

Ala Glu Lys Asn Arg
20

<210> 4419
<211> 13
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<400> 4419

Ala Glu Val Glu Thr Asp Lys Ala Thr Val Gly Phe Glu
1 5 10

<210> 4420
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<400> 4420

Gly Pro Pro Pro Pro Gly Met Met Pro Val Gly Pro Ala Pro Gly Met
1 5 10 15

Arg Pro Pro Met Gly
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<400> 4421

Val Gly Pro Ala Pro Gly Met Arg Pro Pro Met Gly Gly His Met Pro
1 5 10 15

Met Met

<210> 4422
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<400> 4422

Asp Trp Met Glu Glu Glu Glu Gly Ala Gln Arg Glu Lys Glu
1 5 10

<210> 4423
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<400> 4423

Gly Thr Leu His Val Val Gln Arg
1 5

<210> 4424
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Ile Ile Trp Arg Ser Thr Gln Gly
1 5

<210> 4425
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Ile Trp Arg Ser Thr Gln Gly Val
1 5

<210> 4426
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<400> 4426

Leu Gly Thr Leu His Val Val Gln
1 5

<210> 4427
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<400> 4427

Arg Ile Ile Trp Arg Ser Thr Gln
1 5

<210> 4428
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<400> 4428

Arg Val Arg Val Ser Trp Ser Pro
1 5

<210> 4429
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<400> 4429

Arg Val Ser Trp Ser Pro Val Pro
1 5

<210> 4430
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<400> 4430

Ser Ala Ser His Pro Thr Tyr Ser Glu Met Ile Ala Ala Ala Ile Arg
1 5 10 15

Ala Glu Lys Ser Arg
20

<210> 4431
<211> 14
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<400> 4431

Ser Gln Lys Glu Glu Glu Glu Gly Ala Gln Arg Glu Lys Glu
1 5 10

<210> 4432
<211> 8
<212> PRT
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<400> 4432

Thr Leu His Val Val Gln Arg Gly
1 5

<210> 4433
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<400> 4433

Val Pro Arg Ala Gln Gly Phe Leu
1 5

<210> 4434
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<400> 4434

Val Arg Val Ser Trp Ser Pro Val
1 5

<210> 4435
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<400> 4435

Glu Cys Leu Pro Gln His Ala Met Phe Gly Asn Asp Thr Ile Thr Cys
1 5 10 15

Thr Thr His Gly Asn
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<212> PRT
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<400> 4436

Lys Leu Pro Val Lys Lys Ala Thr Val Val Tyr Gln Gly Glu Arg
1 5 10 15

<210> 4437
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<400> 4437

Leu Pro Val Lys Lys Ala Thr Val Val Tyr Gln Gly Glu Arg Val Lys
1 5 10 15

<210> 4438
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<400> 4438

Pro Val Lys Lys Ala Thr Val Val Tyr Gln Gly Glu Arg Val
1 5 10

<210> 4439
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<213> Unknown

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Ala Pro Val Cys Val Trp Glu Arg Leu Ser Pro Tyr Arg Glu Arg Cys
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Val

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<213> Unknown

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1 5 10 15

Val

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<213> Unknown

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Ala Pro Val Cys Val Trp Glu Arg Leu Ser Pro Tyr Arg Glu Arg Cys
1 5 10 15

Val Pro Ala Glu Gly
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Cys His Trp Asp Pro Phe Ser Leu Ser Ala Tyr Phe Pro Gly Gly Gly
1 5 10 15

Ser Cys

<210> 4443
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His Trp Asp Pro Phe Ser Leu Ser Ala Tyr Phe Pro
1 5 10

<210> 4444
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His Trp Asp Pro Phe Ser Leu Ser Ala Tyr Phe Pro
1 5 10

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His Trp Asp Pro Phe Ser Leu Ser Ala Tyr Phe Pro Gly Gly Gly Ser
1 5 10 15

<210> 4446
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<400> 4446

Ser Gly Arg Gly Lys Gly Gly Lys Gly Leu Gly Lys Gly Gly Ala Lys
1 5 10 15

Arg His Arg Lys Val Leu
20

<210> 4447
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<400> 4447

Ser Gly Arg Gly Lys Gly Gly Lys Gly Leu Gly Lys Gly Gly Ala Lys
1 5 10 15

Arg His Arg Lys Val Leu

20

<210> 4448
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<212> PRT
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Asp Trp Glu Tyr Ser
1 5

<210> 4449
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<220>
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<400> 4449

Asp Trp Glu Tyr Ser Val Trp Ser Leu Asn
1 5 10

<210> 4450
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<212> PRT
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<400> 4450

Leu Pro Asp Pro Tyr Gln Lys Gln Cys Asp Asp Phe Val Ala Glu Tyr
1 5 10 15

Glu Pro

<210> 4451
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<400> 4451

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

Arg Thr Thr Ser Lys
20

<210> 4452
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<212> PRT
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<400> 4452

Pro Pro Gly Met Arg Pro Pro Met Gly Pro Met Gly Ile Pro Pro
1 5 10 15

<210> 4453
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<212> PRT
<213> Burkholderia fungorum

<400> 4453

Arg Ala Gly Thr Asp Glu Gly Phe Gly
1 5

<210> 4454
<211> 17
<212> PRT
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<400> 4454

Asp Gly Lys Trp His Thr Val Lys Thr Glu Tyr Ile Lys Arg Lys Ala
1 5 10 15

Phe

<210> 4455
<211> 12
<212> PRT
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<400> 4455

Gly Ala Arg Gly Leu Thr Gly Arg Pro Gly Asp Ala
1 5 10

<210> 4456
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<400> 4456

Gly Ala Arg Gly Leu Thr Gly Arg Pro Gly Asp Ala
1 5 10

<210> 4457
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<400> 4457

Gly Arg Leu His Phe Met Phe Asp Leu Gly Lys Gly Arg Thr Lys Val
1 5 10 15

Ser His Pro

<210> 4458
<211> 17
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<400> 4458

Lys Ala Thr Pro Met Leu Lys Met Arg Thr Ser Phe His Gly Cys Ile
1 5 10 15

Lys

<210> 4459
<211> 21
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<400> 4459

Lys Asn Leu Glu Ile Ser Arg Ser Thr Phe Asp Leu Leu Arg Asn Ser
1 5 10 15

Tyr Gly Val Arg Lys
20

<210> 4460
<211> 22
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<400> 4460

Lys Gln Asn Cys Leu Ser Ser Arg Ala Ser Phe Arg Gly Cys Val Arg
1 5 10 15

Asn Leu Arg Leu Ser Arg
20

<210> 4461
<211> 22
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<400> 4461

Arg Pro Val Arg His Ala Gln Cys Arg Val Cys Asp Gly Asn Ser Thr
1 5 10 15

Asn Pro Arg Glu Arg His
20

<210> 4462
<211> 19
<212> PRT
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<400> 4462

Thr Ser Leu Arg Lys Ala Leu Leu His Ala Pro Thr Gly Ser Tyr Ser
1 5 10 15

Asp Gly Gln

<210> 4463
<211> 15
<212> PRT
<213> Unknown

<220>
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<400> 4463

Asp His Arg Ser Pro Pro Trp Leu Thr Ser Leu Leu Thr Ile Ser
1 5 10 15

<210> 4464
<211> 15
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<213> Unknown

<220>
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<400> 4464

Asp Thr Trp Pro Thr Ala Arg Leu Thr Ser Ser Met Gln Tyr Ile
1 5 10 15

<210> 4465
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<212> PRT
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<220>
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<400> 4465

Gly His Arg Tyr Thr Ser Ser Val Ser Leu Thr Glu Ala Cys Pro
1 5 10 15

<210> 4466
<211> 15
<212> PRT
<213> Unknown

<220>
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<400> 4466

His Thr Tyr Thr Ser His Leu Arg Tyr Val Pro Pro Ile Ser Leu
1 5 10 15

<210> 4467
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<212> PRT
<213> Unknown

<220>
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<400> 4467

Lys Leu Thr Ser Ser Leu Arg Cys Asn Cys Pro Pro Leu Arg Phe
1 5 10 15

<210> 4468
<211> 15
<212> PRT
<213> Unknown

<220>
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<400> 4468

Lys Leu Thr Ser Ser Leu Arg Tyr Asn Ser Pro Pro Leu Cys Phe
1 5 10 15

<210> 4469
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<212> PRT
<213> Unknown

<220>
<223> epitope involved in systemic lupus

<400> 4469

Lys Ser Thr Ser Ser Leu Arg Asp Asn Ser Pro Pro Val Cys Phe
1 5 10 15

<210> 4470
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<213> Unknown

<220>
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<400> 4470

Gln Ala Pro Arg Leu Met Ser Ser Leu Ser Tyr Phe Pro Gln Ser
1 5 10 15

<210> 4471
<211> 15
<212> PRT
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<220>
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<400> 4471

Arg Asp Gly Gln Arg Leu Thr Ser Ser Lys Thr Met Leu Pro Tyr
1 5 10 15

<210> 4472
<211> 10
<212> PRT
<213> Unknown

<220>
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<400> 4472

Arg Leu Thr Ser Ser Leu Arg Tyr Asn Pro
1 5 10

<210> 4473
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<220>
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<400> 4473

Arg Arg Thr Pro Asp Pro Ala Val Ser Pro Trp Gln Leu Thr Tyr
1 5 10 15

<210> 4474
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<220>
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<400> 4474

Thr His Asp Leu Ser Ser Arg Ala Ser Ser Ser Leu Ser Tyr Asn
1 5 10 15

<210> 4475
<211> 7
<212> PRT
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<400> 4475

Ala Thr Val Gln Leu Pro Gln
1 5

<210> 4476
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<400> 4476

Gln Pro His Ser Arg Pro Tyr
1 5

<210> 4477
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Ala Ser Gly Phe Thr Phe Ser Asn Tyr Ala Met His Trp Val Arg
1 5 10 15

<210> 4478
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<400> 4478

Gly Leu Glu Trp Val Ala Val Ile Ser Tyr Asp Gly Gly Asn Lys
1 5 10 15

<210> 4479
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Lys Tyr Tyr Ala Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg
1 5 10 15

<210> 4480
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<212> PRT
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<400> 4480

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

1 5 10

<210> 4481
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<212> PRT
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<400> 4481

Met Tyr Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp
1 5 10

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<400> 4482

Gln Ala Pro Gly Lys Gly Leu Glu Trp Val Ala Val Ile Ser Tyr
1 5 10 15

<210> 4483
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<400> 4483

Val Ala Val Ile Ser Tyr Asp Gly Gly Asn Lys Tyr Tyr Ala Asp
1 5 10 15

<210> 4484
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<212> PRT
<213> Homo sapiens

<400> 4484

Ala Leu Arg Glu Tyr Arg Lys Lys Met Asp Ile Pro Ala
1 5 10

<210> 4485
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<213> Homo sapiens

<400> 4485

Gly Gly Pro Pro Met Met Pro Met Met Gly Pro Pro Pro Pro Gly Met
1 5 10 15

Met Pro Val Gly Pro Ala Pro Gly Met Arg Pro Pro Met
20 25

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<211> 31
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<213> Homo sapiens

<400> 4486

His Lys Glu Asn Val Lys Asp Tyr Tyr Gln Lys Trp Met Glu Glu Gln
1 5 10 15

Ala Gln Ser Leu Ile Asp Lys Thr Thr Ala Ala Phe Gln Gln Gly
20 25 30

<210> 4487
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<400> 4487

Ala Pro Pro Asp Asp Gly Pro Pro
1 5

<210> 4488
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<400> 4488

Cys Glu Thr Asn Thr Gly Glu Val
1 5

<210> 4489
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<400> 4489

Glu Glu Glu Glu Asp Gly Glu Met
1 5

<210> 4490
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<400> 4490

Glu Glu Leu Gln Lys Arg Glu Glu
1 5

<210> 4491
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<400> 4491

Glu Ile His Ser Lys Thr Lys Ser
1 5

<210> 4492
<211> 8
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<400> 4492

Asn Thr Glu Glu Tyr Ile Asp Gly
1 5

<210> 4493
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<400> 4493

Pro Asp Gly Pro Asp Gly Pro Glu
1 5

<210> 4494
<211> 8
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<400> 4494

Trp Ser Lys Ala His Pro Pro Glu
1 5

<210> 4495
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<400> 4495

Phe Cys Pro Asp Val Glu Phe Lys Arg Arg Phe Lys Glu Ala Phe Ser
1 5 10 15

Lys Ala Ala Gln Gln Thr Lys Gly
20

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<211> 26
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<400> 4496

Phe Gly His Ile Ser Gly Gly His Ile Asn Pro Ala Val Thr Val Ala
1 5 10 15

Met Val Cys Thr Arg Lys Ile Ser Ile Ala
20 25

<210> 4497
<211> 22
<212> PRT
<213> Homo sapiens

<400> 4497

Met Ser Asp Arg Pro Thr Ala Arg Arg Trp Gly Lys Cys Gly Pro Leu
1 5 10 15

Cys Thr Arg Glu Asn Ile
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<210> 4498
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<212> PRT
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<400> 4498

Pro Pro Pro Gly Ile Arg
1 5

<210> 4499
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<400> 4499

Pro Pro Pro Gly Met Arg
1 5

<210> 4500
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<212> PRT
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<400> 4500

Pro Gln Gly Arg
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<210> 4501
<211> 18
<212> PRT
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<400> 4501

Pro Glu Ser Phe Asp Gly Asp Pro Ala Ser Asn Thr Ala Pro Leu Gln
1 5 10 15

Pro Glu

<210> 4502
<211> 17
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<400> 4502

Lys Ile His Ala Arg Glu Ile Phe Asp Ser Arg Gly Asn Pro Thr Val
1 5 10 15

Glu

<210> 4503
<211> 8
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<400> 4503

Pro Asp Asp Leu Pro Phe Ser Thr
1 5

<210> 4504
<211> 13
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<400> 4504

Gly Arg Pro Gly Arg Arg Gly Arg Pro Gly Leu Lys Gly
1 5 10

<210> 4505
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<212> PRT
<213> Homo sapiens

<400> 4505

Pro Gly Lys Val Gly Pro Lys Gly Pro Met Gly Pro Lys
1 5 10

<210> 4506
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<400> 4506

Tyr Asn Gln Tyr Ser Gln Arg Tyr His Gln Arg Thr Asn
1 5 10

<210> 4507
<211> 15
<212> PRT
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<400> 4507

Ala Asp Ser Ala Ser Ser Ser Glu Ser Glu Arg Asn Ile Thr Ile
1 5 10 15

<210> 4508
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4508

Ala Lys Ala Thr Lys Asp Val Glu Arg Asn Leu Ser Arg Asp Leu
1 5 10 15

<210> 4509
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4509

Asp Asp Lys Lys Lys Lys Glu Ala Ala Gln Lys Lys Ala Thr Glu
1 5 10 15

<210> 4510
<211> 15
<212> PRT
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<400> 4510

Asp Gly Leu Arg Asn Ser Thr Gly Leu Gly Ser Gln Asn Lys Phe
1 5 10 15

<210> 4511
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<212> PRT
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<400> 4511

Asp Val Glu Arg Asn Leu Ser Arg Asp Leu Val Gln Glu Glu Glu
1 5 10 15

<210> 4512
<211> 15
<212> PRT
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<400> 4512

His Tyr Glu Asn Ser Gln Arg Gly Pro Val Ser Ser Thr Ser Asp
1 5 10 15

<210> 4513
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4513

Lys Glu Ala Ala Gln Lys Lys Ala Thr Glu Gln Lys Ile Lys Val
1 5 10 15

<210> 4514
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4514

Lys Lys Ala Thr Glu Gln Lys Ile Lys Val Pro Glu Gln Ile Lys
1 5 10 15

<210> 4515
<211> 15
<212> PRT
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<400> 4515

Lys Lys Lys Lys Lys Asp Asp Lys Lys Lys Lys Glu Ala Ala Gln
1 5 10 15

<210> 4516
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<212> PRT
<213> Homo sapiens

<400> 4516

Lys Asn Ala Val Val Ser Asp Leu Ser Glu Lys Glu Ala Trp Pro
1 5 10 15

<210> 4517
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4517

Lys Gln Leu Leu Lys Arg Gly Gln His Phe Pro Val Ile Ala Ala
1 5 10 15

<210> 4518
<211> 15
<212> PRT

<213> Homo sapiens

<400> 4518

Lys Arg Ala Thr Ala Asn Asn Gln Gln Pro Gln Gln Gln Gln Gln
1 5 10 15

<210> 4519
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<212> PRT
<213> Homo sapiens

<400> 4519

Leu Ser Arg Asp Leu Val Gln Glu Glu Glu Gln Leu Met Glu Glu
1 5 10 15

<210> 4520
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4520

Met Arg Glu Leu Glu Ala Lys Ala Thr Lys Asp Val Glu Arg Asn
1 5 10 15

<210> 4521
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4521

Asn Leu Gly Ser Ala Val Lys Val Leu Asn Ser Gln Ser Glu Ser
1 5 10 15

<210> 4522
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4522

Asn Asn Gln Gln Pro Gln Gln Gln Gln Gln Gln Gln Gln Pro Gln
1 5 10 15

<210> 4523
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4523

Asn Ser Lys Asn Gln Ser Asp Ile Asn His Ser Thr Ser Gly Ser
1 5 10 15

<210> 4524
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4524

Pro Gln Ala Leu Pro Arg Tyr Pro Arg Glu Val Pro Pro Arg Phe
1 5 10 15

<210> 4525
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4525

Pro Val Ile Ala Ala Asn Leu Gly Ser Ala Val Lys Val Leu Asn
1 5 10 15

<210> 4526
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4526

Gln Lys Ile Lys Val Pro Glu Gln Ile Lys Pro Ser Val Ser Gln
1 5 10 15

<210> 4527
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4527

Gln Leu Met Glu Glu Lys Lys Lys Lys Lys Asp Asp Lys Lys Lys
1 5 10 15

<210> 4528
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4528

Gln Pro Gln Gln Gln Pro Gln Ala Leu Pro Arg Tyr Pro Arg Glu
1 5 10 15

<210> 4529
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4529

Gln Pro Gln Gln Gln Gln Pro Gln Gln Gln Pro Gln Ala Leu Pro

1 5 10 15

<210> 4530
<211> 15
<212> PRT
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<400> 4530

Gln Gln Pro Gln Pro Gln Pro Gln Gln Gln Gln Pro Gln Gln Gln
1 5 10 15

<210> 4531
<211> 15
<212> PRT
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<400> 4531

Gln Gln Gln Pro Gln Gln Gln Pro Gln Pro Gln Pro Gln Gln Gln
1 5 10 15

<210> 4532
<211> 15
<212> PRT
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<400> 4532

Gln Gln Gln Pro Gln Gln Gln Gln Pro Gln Gln Gln Pro Gln Pro
1 5 10 15

<210> 4533
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4533

Gln Gln Gln Gln Gln Gln Gln Gln Pro Gln Gln Gln Gln Pro Gln
1 5 10 15

<210> 4534
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4534

Gln Arg Gly Pro Val Ser Ser Thr Ser Asp Ser Ser Thr Asn Cys
1 5 10 15

<210> 4535
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4535

Arg His Gln Glu His Lys Gln Leu Leu Lys Arg Gly Gln His Phe
1 5 10 15

<210> 4536
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4536

Arg Asn Ile Thr Ile Met Ala Ser Gly Asn Thr Gly Gly Glu Lys
1 5 10 15

<210> 4537
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4537

Arg Tyr Pro Arg Glu Val Pro Pro Arg Phe Arg His Gln Glu His
1 5 10 15

<210> 4538
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4538

Ser Ala Leu Thr Asn Gln Gln Pro Gln Asn Asn Gly Glu Val Gln
1 5 10 15

<210> 4539
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4539

Ser Asp Ile Asn His Ser Thr Ser Gly Ser His Tyr Glu Asn Ser
1 5 10 15

<210> 4540
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4540

Ser Asn Asn Gly Thr Ser Thr Ala Thr Ser Thr Asn Asn Asn Ala
1 5 10 15

<210> 4541
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<212> PRT
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<400> 4541

Ser Ser Thr Ser Asp Ser Ser Thr Asn Cys Lys Asn Ala Val Val
1 5 10 15

<210> 4542
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4542

Ser Thr Ala Thr Ser Thr Asn Asn Asn Ala Lys Arg Ala Thr Ala
1 5 10 15

<210> 4543
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4543

Ser Thr Gly Leu Gly Ser Gln Asn Lys Phe Val Val Gly Ser Ser
1 5 10 15

<210> 4544
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4544

Thr Asn Asn Asn Ala Lys Arg Ala Thr Ala Asn Asn Gln Gln Pro
1 5 10 15

<210> 4545
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4545

Val Lys Val Leu Asn Ser Gln Ser Glu Ser Ser Ala Leu Thr Asn
1 5 10 15

<210> 4546
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4546

Val Pro Pro Arg Phe Arg His Gln Glu His Lys Gln Leu Leu Lys
1 5 10 15

<210> 4547
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4547

Val Gln Glu Glu Glu Gln Leu Met Glu Glu Lys Lys Lys Lys Lys
1 5 10 15

<210> 4548
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4548

Lys Leu Thr Ser Glu Ala Arg Gly Arg Ile Pro Val Ala Gln Lys
1 5 10 15

<210> 4549
<211> 19
<212> PRT
<213> Homo sapiens

<400> 4549

Ala Leu Met Arg Gly Lys Ser Thr Glu Glu Ala Arg Lys Glu Leu Gln
1 5 10 15

Ala Ala Gly

<210> 4550
<211> 19
<212> PRT
<213> Homo sapiens

<400> 4550

Ala Ser Thr Asn Gly Leu Ile Asn Phe Ile Lys Gln Gln Arg Glu Ala
1 5 10 15

Arg Val Gln

<210> 4551
<211> 19
<212> PRT
<213> Homo sapiens

<400> 4551

Glu Asp Leu Glu Arg Leu Leu Pro His Lys Val Phe Glu Gly Asn Arg
1 5 10 15

Pro Thr Asn

<210> 4552
<211> 19
<212> PRT
<213> Homo sapiens

<400> 4552

Phe Glu Phe Trp Asp Trp Val Gly Gly Arg Tyr Ser Leu Trp Ser Ala
1 5 10 15

Ile Gly Leu

<210> 4553
<211> 19
<212> PRT
<213> Homo sapiens

<400> 4553

Asn Tyr Thr Glu Gly Arg Ala Val Leu His Val Ala Leu Arg Asn Arg
1 5 10 15

Ser Asn Thr

<210> 4554
<211> 19
<212> PRT
<213> Homo sapiens

<400> 4554

Ser Phe Cys Gln Arg Val Arg Ser Gly Asp Trp Lys Gly Tyr Thr Gly
1 5 10 15

Lys Thr Ile

<210> 4555
<211> 21
<212> PRT
<213> Homo sapiens

<400> 4555

Tyr Leu Ala Ser Ala Ser Thr Met Asp His Ala Arg His Gly Phe Leu
1 5 10 15

Pro Arg Arg His Arg
20

<210> 4556
<211> 5
<212> PRT
<213> Homo sapiens

<400> 4556

Pro Ala Pro Lys Lys
1 5

<210> 4557
<211> 5
<212> PRT
<213> Homo sapiens

<400> 4557

Pro Ala Pro Lys Lys
1 5

<210> 4558
<211> 7
<212> PRT
<213> Homo sapiens

<400> 4558

Pro Ala Pro Lys Lys Gly Ser
1 5

<210> 4559
<211> 8
<212> PRT
<213> Homo sapiens

<400> 4559

Pro Ala Pro Lys Lys Gly Ser Lys
1 5

<210> 4560
<211> 9
<212> PRT
<213> Homo sapiens

<400> 4560

Pro Ala Pro Lys Lys Gly Ser Lys Lys
1 5

<210> 4561
<211> 5
<212> PRT
<213> Homo sapiens

<400> 4561

Pro Glu Pro Ala Lys
1 5

<210> 4562
<211> 21
<212> PRT
<213> Homo sapiens

<400> 4562

Pro Glu Pro Ala Lys Ser Ala Pro Ala Pro Lys Lys Gly Ser Lys Lys
1 5 10 15

Ala Val Thr Lys Ala
20

<210> 4563
<211> 21
<212> PRT
<213> Homo sapiens

<400> 4563

Pro Glu Pro Ala Lys Ser Ala Pro Ala Pro Lys Lys Gly Ser Lys Lys
1 5 10 15

Ala Val Thr Lys Ala
20

<210> 4564
<211> 21
<212> PRT
<213> Homo sapiens

<400> 4564

Pro Glu Pro Ala Lys Ser Ala Pro Ala Pro Lys Lys Gly Ser Lys Lys
1 5 10 15

Ala Val Thr Lys Ala
20

<210> 4565
<211> 9
<212> PRT
<213> Mus musculus

<400> 4565

Lys Thr Glu Lys Asp Pro Glu Ser Glu
1 5

<210> 4566
<211> 12

<212> PRT
<213> Bos taurus

<400> 4566

Ala Ala Gly Ala Val Met Arg Gly Phe Val Phe Thr
1 5 10

<210> 4567
<211> 13
<212> PRT
<213> Homo sapiens

<400> 4567

Ile Pro Ser Thr Val Lys Ala Gly Glu Leu Glu Lys Ile
1 5 10

<210> 4568
<211> 12
<212> PRT
<213> Homo sapiens

<400> 4568

Ile Ser Arg Cys Gln Val Cys Met Lys Lys Arg His
1 5 10

<210> 4569
<211> 5
<212> PRT
<213> Homo sapiens

<400> 4569

Met Lys Lys Arg His
1 5

<210> 4570
<211> 11
<212> PRT
<213> Homo sapiens

<400> 4570

Ser Leu Asn Pro Glu Arg Met Phe Arg Lys Pro
1 5 10

<210> 4571
<211> 36
<212> PRT
<213> Homo sapiens

<400> 4571

Ser Leu Asn Pro Glu Arg Met Phe Arg Lys Pro Ile Pro Ser Thr Val
1 5 10 15

Lys Ala Gly Glu Leu Glu Lys Ile Ile Ser Arg Cys Gln Val Cys Met
            20   25   30

Lys Lys Arg His
        35

<210> 4572
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4572

Thr Ala Ile Pro Ser Cys Pro Glu Gly Thr Val Pro Leu Tyr Ser
1   5   10   15

<210> 4573
<211> 9
<212> PRT
<213> Homo sapiens

<400> 4573

Ile Ser Leu Trp Lys Gly Phe Ser Phe
1   5

<210> 4574
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4574

Thr Asp Ile Pro Pro Cys Pro His Gly Trp Ile Ser Leu Trp Lys
1   5   10   15

<210> 4575
<211> 20
<212> PRT
<213> Bos taurus

<400> 4575

Cys Asn Phe Ala Ser Arg Asn Asp Tyr Ser Tyr Trp Leu Ser Thr Pro
1   5   10   15

Glu Pro Met Pro
            20

<210> 4576
<211> 9
<212> PRT
<213> Homo sapiens

<400> 4576

Gly Ser Pro Ala Thr Trp Thr Thr Arg
1 5

<210> 4577
<211> 239
<212> PRT
<213> Homo sapiens

<400> 4577

Arg Gly Asp Ser Gly Ser Pro Ala Thr Trp Thr Thr Arg Gly Phe Val
1 5 10 15

Phe Thr Arg His Ser Gln Thr Thr Ala Ile Pro Ser Cys Pro Glu Gly
20 25 30

Thr Val Pro Leu Tyr Ser Gly Phe Ser Phe Leu Phe Val Gln Gly Asn
35 40 45

Gln Arg Ala His Gly Gln Asp Leu Gly Thr Leu Gly Ser Cys Leu Gln
50 55 60

Arg Phe Thr Thr Met Pro Phe Leu Phe Cys Asn Val Asn Asp Val Cys
65 70 75 80

Asn Phe Ala Ser Arg Asn Asp Tyr Ser Tyr Trp Leu Ser Thr Pro Ala
85 90 95

Leu Met Pro Met Asn Met Ala Pro Ile Thr Gly Arg Ala Leu Glu Pro
100 105 110

Tyr Ile Ser Arg Cys Thr Val Cys Glu Gly Pro Ala Ile Ala Ile Ala
115 120 125

Val His Ser Gln Thr Thr Asp Ile Pro Pro Cys Pro His Gly Trp Ile
130 135 140

Ser Leu Trp Lys Gly Phe Ser Phe Ile Met Phe Thr Ser Ala Gly Ser
145 150 155 160

Glu Gly Thr Gly Gln Ala Leu Ala Ser Pro Gly Ser Cys Leu Glu Glu
165 170 175

Phe Arg Ala Ser Pro Phe Leu Glu Cys His Gly Arg Gly Thr Cys Asn
180 185 190

Tyr Tyr Ser Asn Ser Tyr Ser Phe Trp Leu Ala Ser Leu Asn Pro Glu
195 200 205

Arg Met Phe Arg Lys Pro Ile Pro Ser Thr Val Lys Ala Gly Glu Leu
210 215 220

Glu Lys Ile Ile Ser Arg Cys Gln Val Cys Met Lys Lys Arg His
225 230 235

<210> 4578
<211> 15
<212> PRT
<213> Bos taurus

<400> 4578

Cys Phe Glu Gly Gln Glu Lys Ala His Asn Gln Asp Leu Gly Leu
1 5 10 15

<210> 4579
<211> 15
<212> PRT
<213> Bos taurus

<400> 4579

Cys His Gly Arg Gly Thr Cys Asn Tyr Tyr Ala Asn Ala Tyr Ser
1 5 10 15

<210> 4580
<211> 19
<212> PRT
<213> Bos taurus

<400> 4580

Cys Asn Tyr Tyr Ser Asn Ser Tyr Ser Phe Trp Leu Ala Ser Leu Asp
1 5 10 15

Pro Lys Arg

<210> 4581
<211> 13
<212> PRT
<213> Bos taurus

<400> 4581

Cys Pro Ala Gly Trp Ile Ser Leu Trp Lys Gly Phe Ser
1 5 10

<210> 4582
<211> 23
<212> PRT
<213> Bos taurus

<400> 4582

Cys Thr Ile Glu Arg Ser Glu Met Phe Lys Pro Thr Pro Ser Thr Leu
1 5 10 15

Lys Ala Gly Glu Leu Arg Thr
20

<210> 4583
<211> 14
<212> PRT
<213> Bos taurus

<400> 4583

Cys Tyr Tyr Ala Ser Arg Asn Asp Lys Ser Tyr Trp Leu Ser
1 5 10

<210> 4584
<211> 18
<212> PRT
<213> Bos taurus

<400> 4584

Asp Val Cys Asn Phe Ala Ser Arg Asn Asp Tyr Ser Tyr Trp Leu Ser
1 5 10 15

Thr Pro

<210> 4585
<211> 6
<212> PRT
<213> Bos taurus

<400> 4585

Gly Leu Gly Phe Tyr Gly
1 5

<210> 4586
<211> 18
<212> PRT
<213> Homo sapiens

<400> 4586

Lys Phe Asp Val Pro Cys Gly Gly Arg Asp Cys Ser Gly Gly Cys Gln
1 5 10 15

Cys Tyr

<210> 4587
<211> 14

<212> PRT
<213> Bos taurus

<400> 4587

Leu Glu Pro Tyr Ile Ser Arg Cys Thr Val Cys Glu Gly Pro
1 5 10

<210> 4588
<211> 13
<212> PRT
<213> Bos taurus

<400> 4588

Pro Tyr Ala Leu Gly Lys Glu Glu Arg Asp Arg Tyr Arg
1 5 10

<210> 4589
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4589

Ala Ile Ala Val His Ser Gln Thr Thr Asp Ile Pro Pro Cys Pro His
1 5 10 15

Gly Trp Ile Ser
20

<210> 4590
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4590

Ala Leu Ala Ser Pro Gly Ser Cys Leu Glu Glu Phe Arg Ala Ser Pro
1 5 10 15

Phe Leu Glu Cys
20

<210> 4591
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4591

Ala Leu Met Pro Met Asn Met Ala Pro Ile Thr Gly Arg Ala Leu Glu
1 5 10 15

Pro Tyr Ile Ser
20

<210> 4592
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4592

Glu Phe Arg Ala Ser Pro Phe Leu Glu Cys His Gly Arg Gly Thr Cys
1 5 10 15

Asn Tyr Tyr Ser
20

<210> 4593
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4593

Phe Thr Thr Met Pro Phe Leu Phe Cys Asn Val Asn Asp Val Cys Asn
1 5 10 15

Phe Ala Ser Arg
20

<210> 4594
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4594

His Gly Arg Gly Thr Cys Asn Tyr Tyr Ser Asn Ser Tyr Ser Phe Trp
1 5 10 15

Leu Ala Ser Leu
20

<210> 4595
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4595

Ile Pro Pro Cys Pro His Gly Trp Ile Ser Leu Trp Lys Gly Phe Ser
1 5 10 15

Phe Ile Met Phe
20

<210> 4596

<211> 20
<212> PRT
<213> Homo sapiens

<400> 4596

Ile Pro Ser Cys Pro Glu Gly Thr Val Pro Leu Tyr Ser Gly Phe Ser
1 5 10 15

Phe Leu Phe Val
20

<210> 4597
<211> 14
<212> PRT
<213> Homo sapiens

<400> 4597

Lys Ile Ile Ser Arg Cys Gln Val Cys Met Lys Lys Arg His
1 5 10

<210> 4598
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4598

Leu Gly Thr Leu Gly Ser Cys Leu Gln Arg Phe Thr Thr Met Pro Phe
1 5 10 15

Leu Phe Cys Asn
20

<210> 4599
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4599

Leu Trp Lys Gly Phe Ser Phe Ile Met Phe Thr Ser Ala Gly Ser Glu
1 5 10 15

Gly Thr Gly Gln
20

<210> 4600
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4600

Leu Tyr Ser Gly Phe Ser Phe Leu Phe Val Gln Gly Asn Gln Arg Ala

1 5 10 15

His Gly Gln Asp
20

<210> 4601
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4601

Asn Asp Tyr Ser Tyr Trp Leu Ser Ile Pro Ala Leu Met Pro Met Asn
1 5 10 15

Met Ala Pro Ile
20

<210> 4602
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4602

Asn Ser Tyr Ser Phe Trp Leu Ala Ser Leu Asn Pro Glu Arg Met Phe
1 5 10 15

Arg Lys Pro Ile
20

<210> 4603
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4603

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

Gln Val Cys Met
20

<210> 4604
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4604

Arg Cys Thr Val Cys Glu Gly Pro Ala Ile Ala Ile Ala Val His Ser
1 5 10 15

Gln Thr Thr Asp
20

<210> 4605
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4605

Ser Pro Ala Thr Trp Thr Thr Arg Gly Phe Val Phe Thr Arg His Ser
1 5 10 15

Gln Thr Thr Ala
20

<210> 4606
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4606

Thr Gly Arg Ala Leu Glu Pro Tyr Ile Ser Arg Cys Thr Val Cys Glu
1 5 10 15

Gly Pro Ala Ile
20

<210> 4607
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4607

Thr Ser Ala Gly Ser Glu Gly Thr Gly Gln Ala Leu Ala Ser Pro Gly
1 5 10 15

Ser Cys Leu Glu
20

<210> 4608
<211> 21
<212> PRT
<213> Homo sapiens

<400> 4608

Val Phe Thr Arg His Ser Gln Thr Thr Ala Ile Pro Ser Cys Pro Glu
1 5 10 15

Gly Thr Val Pro Leu
20

<210> 4609
<211> 21
<212> PRT
<213> Homo sapiens

<400> 4609

Val Asn Asp Val Cys Asn Phe Ala Ser Arg Asn Asp Tyr Ser Tyr Trp
1 5 10 15

Leu Ser Thr Pro Ala
20

<210> 4610
<211> 44
<212> PRT
<213> Homo sapiens

<400> 4610

Pro Gly Leu Lys Gly Lys Arg Gly Asp Ser Gly Ser Pro Ala Thr Trp
1 5 10 15

Thr Thr Arg Gly Phe Val Phe Thr Arg His Ser Gln Thr Thr Ala Ile
20 25 30

Pro Ser Cys Pro Glu Gly Thr Val Pro Leu Tyr Ser
35 40

<210> 4611
<211> 1670
<212> PRT
<213> Homo sapiens

<400> 4611

Met Ser Ala Arg Thr Ala Pro Arg Pro Gln Val Leu Leu Leu Pro Leu
1 5 10 15

Leu Leu Val Leu Leu Ala Ala Ala Pro Ala Ala Ser Lys Gly Cys Val
20 25 30

Cys Lys Asp Lys Gly Gln Cys Phe Cys Asp Gly Ala Lys Gly Glu Lys
35 40 45

Gly Glu Lys Gly Phe Pro Gly Pro Pro Gly Ser Pro Gly Gln Lys Gly
50 55 60

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

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

85 90 95

Gly Leu Pro Gly Phe Ser Gly Ser Pro Gly Leu Pro Gly Thr Pro Gly
100 105 110

Asn Thr Gly Pro Tyr Gly Leu Val Gly Val Pro Gly Cys Ser Gly Ser
115 120 125

Lys Gly Glu Gln Gly Phe Pro Gly Leu Pro Gly Thr Pro Gly Tyr Pro
130 135 140

Gly Ile Pro Gly Ala Ala Gly Leu Lys Gly Gln Lys Gly Ala Pro Ala
145 150 155 160

Lys Glu Glu Asp Ile Glu Leu Asp Ala Lys Gly Asp Pro Gly Leu Pro
165 170 175

Gly Ala Pro Gly Pro Gln Gly Leu Pro Gly Pro Pro Gly Phe Pro Gly
180 185 190

Pro Val Gly Pro Pro Gly Pro Pro Gly Phe Phe Gly Phe Pro Gly Ala
195 200 205

Met Gly Pro Arg Gly Pro Lys Gly His Met Gly Glu Arg Val Ile Gly
210 215 220

His Lys Gly Glu Arg Gly Val Lys Gly Leu Thr Gly Pro Pro Gly Pro
225 230 235 240

Pro Gly Thr Val Ile Val Thr Leu Thr Gly Pro Asp Asn Arg Thr Asp
245 250 255

Leu Lys Gly Glu Lys Gly Asp Lys Gly Ala Met Gly Glu Pro Gly Pro
260 265 270

Pro Gly Pro Ser Gly Leu Pro Gly Glu Ser Tyr Gly Ser Glu Lys Gly
275 280 285

Ala Pro Gly Asp Pro Gly Leu Gln Gly Lys Pro Gly Lys Asp Gly Val
290 295 300

Pro Gly Phe Pro Gly Ser Glu Gly Val Lys Gly Asn Arg Gly Phe Pro
305 310 315 320

Gly Leu Met Gly Glu Tyr Gly Ile Lys Gly Gln Lys Gly Asp Ile Gly
325 330 335

```
Pro Pro Gly Phe Arg Gly Pro Thr Glu Tyr Tyr Asp Thr Tyr Gln Glu
            340                 345                 350

Lys Gly Asp Glu Gly Thr Pro Gly Pro Pro Gly Pro Arg Gly Ala Arg
        355                 360                 365

Gly Pro Gln Gly Pro Ser Gly Pro Pro Gly Val Pro Gly Ser Pro Gly
    370                 375                 380

Ser Ser Arg Pro Gly Leu Arg Gly Ala Pro Gly Trp Pro Gly Leu Lys
385                 390                 395                 400

Gly Ser Lys Gly Glu Arg Gly Arg Pro Gly Lys Asp Ala Met Gly Thr
                405                 410                 415

Pro Gly Ser Pro Gly Cys Ala Gly Ser Pro Gly Leu Pro Gly Ser Pro
            420                 425                 430

Gly Pro Pro Gly Pro Pro Gly Asp Ile Val Phe Arg Lys Gly Pro Pro
        435                 440                 445

Gly Asp His Gly Leu Pro Gly Tyr Leu Gly Ser Pro Gly Ile Pro Gly
    450                 455                 460

Val Asp Gly Pro Lys Gly Glu Pro Gly Leu Leu Cys Thr Gln Cys Pro
465                 470                 475                 480

Tyr Ile Pro Gly Pro Pro Gly Leu Pro Gly Leu Pro Gly Leu His Gly
                485                 490                 495

Val Lys Gly Ile Pro Gly Arg Gln Gly Ala Ala Gly Leu Lys Gly Ser
            500                 505                 510

Pro Gly Ser Pro Gly Asn Thr Gly Leu Pro Gly Phe Pro Gly Phe Pro
        515                 520                 525

Gly Ala Gln Gly Asp Pro Gly Leu Lys Gly Glu Lys Gly Glu Thr Leu
    530                 535                 540

Gln Pro Glu Gly Gln Val Gly Val Pro Gly Asp Pro Gly Leu Arg Gly
545                 550                 555                 560

Gln Pro Gly Arg Lys Gly Leu Asp Gly Ile Pro Gly Thr Pro Gly Val
                565                 570                 575

Lys Gly Leu Pro Gly Pro Lys Gly Glu Leu Ala Leu Ser Gly Glu Lys
            580                 585                 590
```

```
Gly Asp Gln Gly Pro Pro Gly Asp Pro Gly Ser Pro Gly Ser Pro Gly
        595                 600                 605

Pro Ala Gly Pro Ala Gly Pro Pro Gly Tyr Gly Pro Gln Gly Glu Pro
    610                 615                 620

Gly Leu Gln Gly Thr Gln Gly Val Pro Gly Ala Pro Gly Pro Pro Gly
625                 630                 635                 640

Glu Ala Gly Pro Arg Gly Glu Leu Ser Val Ser Thr Pro Val Pro Gly
                645                 650                 655

Pro Pro Gly Pro Pro Gly Pro Pro Gly His Pro Gly Pro Gln Gly Pro
            660                 665                 670

Pro Gly Ile Pro Gly Ser Leu Gly Lys Cys Gly Asp Pro Gly Leu Pro
        675                 680                 685

Gly Pro Asp Gly Glu Pro Gly Ile Pro Gly Ile Gly Phe Pro Gly Pro
    690                 695                 700

Pro Gly Pro Lys Gly Asp Gln Gly Phe Pro Gly Thr Lys Gly Ser Leu
705                 710                 715                 720

Gly Cys Pro Gly Lys Met Gly Glu Pro Gly Leu Pro Gly Lys Pro Gly
                725                 730                 735

Leu Pro Gly Ala Lys Gly Glu Pro Ala Val Ala Met Pro Gly Gly Pro
            740                 745                 750

Gly Thr Pro Gly Phe Pro Gly Glu Arg Gly Asn Ser Gly Glu His Gly
        755                 760                 765

Glu Ile Gly Leu Pro Gly Leu Pro Gly Leu Pro Gly Thr Pro Gly Asn
    770                 775                 780

Glu Gly Leu Asp Gly Pro Arg Gly Asp Pro Gly Gln Pro Gly Pro Pro
785                 790                 795                 800

Gly Glu Gln Gly Pro Pro Gly Arg Cys Ile Glu Gly Pro Arg Gly Ala
                805                 810                 815

Gln Gly Leu Pro Gly Leu Asn Gly Leu Lys Gly Gln Gln Gly Arg Arg
            820                 825                 830

Gly Lys Thr Gly Pro Lys Gly Asp Pro Gly Ile Pro Gly Leu Asp Arg
        835                 840                 845
```

```
Ser Gly Phe Pro Gly Glu Thr Gly Ser Pro Gly Ile Pro Gly His Gln
    850                 855                 860

Gly Glu Met Gly Pro Leu Gly Gln Arg Gly Tyr Pro Gly Asn Pro Gly
865                 870                 875                 880

Ile Leu Gly Pro Pro Gly Glu Asp Gly Val Ile Gly Met Met Gly Phe
                885                 890                 895

Pro Gly Ala Ile Gly Pro Pro Gly Pro Pro Gly Asn Pro Gly Arg Pro
            900                 905                 910

Gly Gln Arg Gly Ser Pro Gly Ile Pro Gly Val Lys Gly Gln Arg Gly
        915                 920                 925

Thr Pro Gly Ala Lys Gly Glu Gln Gly Asp Lys Gly Asn Pro Gly Pro
    930                 935                 940

Ser Glu Ile Ser His Val Ile Gly Asp Lys Gly Glu Pro Gly Leu Lys
945                 950                 955                 960

Gly Phe Ala Gly Asn Pro Gly Glu Lys Gly Asn Arg Gly Val Pro Gly
                965                 970                 975

Met Pro Gly Leu Lys Gly Leu Lys Gly Leu Pro Gly Pro Ala Gly Pro
            980                 985                 990

Pro Gly Pro Arg Gly Asp Leu Gly  Ser Thr Gly Asn Pro  Gly Glu Pro
        995                 1000                1005

Gly Leu  Arg Gly Ile Pro Gly  Ser Met Gly Asn Met  Gly Met Pro
    1010                1015                1020

Gly Ser  Lys Gly Lys Arg Gly  Thr Leu Gly Phe Pro  Gly Arg Ala
    1025                1030                1035

Gly Arg  Pro Gly Leu Pro Gly  Ile His Gly Leu Gln  Gly Asp Lys
    1040                1045                1050

Gly Glu  Pro Gly Tyr Ser Glu  Gly Thr Arg Pro Gly  Pro Pro Gly
    1055                1060                1065

Pro Thr  Gly Asp Pro Gly Leu  Pro Gly Asp Met Gly  Lys Lys Gly
    1070                1075                1080

Glu Met  Gly Gln Pro Gly Pro  Pro Gly His Leu Gly  Pro Ala Gly
```

1085 1090 1095

Pro Glu Gly Ala Pro Gly Ser Pro Gly Ser Pro Gly Leu Pro Gly
1100 1105 1110

Lys Pro Gly Pro His Gly Asp Leu Gly Phe Lys Gly Ile Lys Gly
1115 1120 1125

Leu Leu Gly Pro Pro Gly Ile Arg Gly Pro Pro Gly Leu Pro Gly
1130 1135 1140

Phe Pro Gly Ser Pro Gly Pro Met Gly Ile Arg Gly Asp Gln Gly
1145 1150 1155

Arg Asp Gly Ile Pro Gly Pro Ala Gly Glu Lys Gly Glu Thr Gly
1160 1165 1170

Leu Leu Arg Ala Pro Pro Gly Pro Arg Gly Asn Pro Gly Ala Gln
1175 1180 1185

Gly Ala Lys Gly Asp Arg Gly Ala Pro Gly Phe Pro Gly Leu Pro
1190 1195 1200

Gly Arg Lys Gly Ala Met Gly Asp Ala Gly Pro Arg Gly Pro Thr
1205 1210 1215

Gly Ile Glu Gly Phe Pro Gly Pro Pro Gly Leu Pro Gly Ala Ile
1220 1225 1230

Ile Pro Gly Gln Thr Gly Asn Arg Gly Pro Pro Gly Ser Arg Gly
1235 1240 1245

Ser Pro Gly Ala Pro Gly Pro Pro Gly Pro Pro Gly Ser His Val
1250 1255 1260

Ile Gly Ile Lys Gly Asp Lys Gly Ser Met Gly His Pro Gly Pro
1265 1270 1275

Lys Gly Pro Pro Gly Thr Ala Gly Asp Met Gly Pro Pro Gly Arg
1280 1285 1290

Leu Gly Ala Pro Gly Thr Pro Gly Leu Pro Gly Pro Arg Gly Asp
1295 1300 1305

Pro Gly Phe Gln Gly Phe Pro Gly Val Lys Gly Glu Lys Gly Asn
1310 1315 1320

```
Pro Gly  Phe Leu Gly Ser Ile  Gly Pro Pro Gly Pro  Ile Gly Pro
    1325                1330                1335

Lys Gly  Pro Pro Gly Val Arg  Gly Asp Pro Gly Thr  Leu Lys Ile
    1340                1345                1350

Ile Ser  Leu Pro Gly Ser Pro  Gly Pro Pro Gly Thr  Pro Gly Glu
    1355                1360                1365

Pro Gly  Met Gln Gly Glu Pro  Gly Pro Pro Gly Pro  Pro Gly Asn
    1370                1375                1380

Leu Gly  Pro Cys Gly Pro Arg  Gly Lys Pro Gly Lys  Asp Gly Lys
    1385                1390                1395

Pro Gly  Thr Pro Gly Pro Ala  Gly Glu Lys Gly Asn  Lys Gly Ser
    1400                1405                1410

Lys Gly  Glu Pro Gly Pro Ala  Gly Ser Asp Gly Leu  Pro Gly Leu
    1415                1420                1425

Lys Gly  Lys Arg Gly Asp Ser  Gly Ser Pro Ala Thr  Trp Thr Thr
    1430                1435                1440

Arg Gly  Phe Val Phe Thr Arg  His Ser Gln Thr Thr  Ala Ile Pro
    1445                1450                1455

Ser Cys  Pro Glu Gly Thr Val  Pro Leu Tyr Ser Gly  Phe Ser Phe
    1460                1465                1470

Leu Phe  Val Gln Gly Asn Gln  Arg Ala His Gly Gln  Asp Leu Gly
    1475                1480                1485

Thr Leu  Gly Ser Cys Leu Gln  Arg Phe Thr Thr Met  Pro Phe Leu
    1490                1495                1500

Phe Cys  Asn Val Asn Asp Val  Cys Asn Phe Ala Ser  Arg Asn Asp
    1505                1510                1515

Tyr Ser  Tyr Trp Leu Ser Thr  Pro Ala Leu Met Pro  Met Asn Met
    1520                1525                1530

Ala Pro  Ile Thr Gly Arg Ala  Leu Glu Pro Tyr Ile  Ser Arg Cys
    1535                1540                1545

Thr Val  Cys Glu Gly Pro Ala  Ile Ala Ile Ala Val  His Ser Gln
    1550                1555                1560
```

```
Thr Thr  Asp Ile Pro Pro Cys  Pro His Gly Trp Ile  Ser Leu Trp
    1565                1570                1575

Lys Gly  Phe Ser Phe Ile Met  Phe Thr Ser Ala Gly  Ser Glu Gly
    1580                1585                1590

Thr Gly  Gln Ala Leu Ala Ser  Pro Gly Ser Cys Leu  Glu Glu Phe
    1595                1600                1605

Arg Ala  Ser Pro Phe Leu Glu  Cys His Gly Arg Gly  Thr Cys Asn
    1610                1615                1620

Tyr Tyr  Ser Asn Ser Tyr Ser  Phe Trp Leu Ala Ser  Leu Asn Pro
    1625                1630                1635

Glu Arg  Met Phe Arg Lys Pro  Ile Pro Ser Thr Val  Lys Ala Gly
    1640                1645                1650

Glu Leu  Glu Lys Ile Ile Ser  Arg Cys Gln Val Cys  Met Lys Lys
    1655                1660                1665

Arg His
    1670
```

<210> 4612
<211> 20
<212> PRT
<213> Mus musculus

<400> 4612

```
Cys Pro Gln Asp Trp Val Ser Leu Trp Lys Gly Phe Ser Phe Ile Met
1               5                   10                  15

Phe Thr Ser Ala
            20
```

<210> 4613
<211> 11
<212> PRT
<213> Mus musculus

<400> 4613

```
Asp Trp Val Ser Leu Trp Lys Gly Phe Ser Phe
1               5                   10
```

<210> 4614
<211> 16
<212> PRT
<213> Mycobacterium tuberculosis

<400> 4614

Asp Leu Ser Leu Leu Gly Lys Ala Arg Lys Val Val Val Thr Lys Asp
1 5 10 15

<210> 4615
<211> 15
<212> PRT
<213> Mycobacterium bovis

<400> 4615

Asn Pro Leu Gly Leu Lys Arg Gly Ile Glu Lys Ala Val Glu Lys
1 5 10 15

<210> 4616
<211> 16
<212> PRT
<213> Homo sapiens

<400> 4616

Gln Pro His Asp Leu Gly Lys Val Gly Glu Val Ile Val Thr Lys Asp
1 5 10 15

<210> 4617
<211> 13
<212> PRT
<213> Human herpesvirus

<400> 4617

Ser Tyr Leu Lys Asp Ser Asp Phe Leu Asp Ala Ala Leu
1 5 10

<210> 4618
<211> 13
<212> PRT
<213> Homo sapiens

<400> 4618

Ser Tyr Leu Gln Asp Ser Asp Pro Asp Ser Phe Gln Asp
1 5 10

<210> 4619
<211> 14
<212> PRT
<213> Homo sapiens

<400> 4619

Ala Leu Asn Glu Asp Leu Arg Ser Trp Thr Ala Ala Asp Thr
1 5 10

<210> 4620

<211> 14
<212> PRT
<213> Homo sapiens

<400> 4620

Ala Leu Asn Glu Asp Leu Ser Ser Trp Thr Ala Ala Asp Thr
1 5 10

<210> 4621
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4621

Asn Pro Val Glu Ile Arg Arg Gly Val Met Leu Ala Val Asp Ala
1 5 10 15

<210> 4622
<211> 25
<212> PRT
<213> Homo sapiens

<400> 4622

Gln Val Ser Gly Pro Glu Arg Thr Ile Pro Ile Thr Arg Glu Glu Lys
1 5 10 15

Pro Ala Val Thr Ala Ala Pro Lys Lys
20 25

<210> 4623
<211> 14
<212> PRT
<213> Homo sapiens

<400> 4623

Asp Leu Tyr Ile Leu Met Ser His Thr Ser Gly Ser Ala Ala
1 5 10

<210> 4624
<211> 14
<212> PRT
<213> Homo sapiens

<400> 4624

Phe Leu Gly Glu Leu Thr Ser Ser Glu Val Ala Thr Glu Val
1 5 10

<210> 4625
<211> 14
<212> PRT
<213> Homo sapiens

<400> 4625

Gly Val Tyr Leu Leu Thr Ser His Arg Thr Ala Thr Ala Ala
1 5 10

<210> 4626
<211> 16
<212> PRT
<213> Homo sapiens

<400> 4626

Lys Ser Met Val Ile Leu Thr Ser Thr Val Thr Ala Gly Thr Ala Glu
1 5 10 15

<210> 4627
<211> 12
<212> PRT
<213> Bos taurus

<400> 4627

Asn Asn Arg Glu Arg Arg Gly Ile Ala Leu Asp Gly
1 5 10

<210> 4628
<211> 15
<212> PRT
<213> Bos taurus

<400> 4628

Ala Asp Gly Ser Ser Trp Glu Gly Val Gly Val Val Pro Asp Val
1 5 10 15

<210> 4629
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4629

Gly Pro Thr His Leu Phe Gln Pro Ser Leu Val Leu Asp Met Ala Lys
1 5 10 15

Val Leu Leu Asp
20

<210> 4630
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4630

Ser Gly Ile Pro Tyr Ile Ile Ser Tyr Leu His Pro Gly Asn Thr Ile
1 5 10 15

Leu His Val Asp
20

<210> 4631
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4631

Ala Ser Ser Thr Ile Ile Lys Glu Gly Ile Asp Arg Thr Val Leu Gly
1 5 10 15

Ile Leu Val Ser
20

<210> 4632
<211> 13
<212> PRT
<213> Homo sapiens

<400> 4632

Asp Thr Asn Leu Ala Ser Ser Thr Ile Ile Lys Glu Gly
1 5 10

<210> 4633
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4633

Gly Phe Leu Gly Glu Leu Thr Ser Ser Glu Val Ala Thr Glu Val Pro
1 5 10 15

Phe Arg Leu Met
20

<210> 4634
<211> 16
<212> PRT
<213> Bos taurus

<400> 4634

Leu Pro Leu Leu Ala Asn Asn Arg Glu Arg Arg Gly Ile Ala Leu Asp
1 5 10 15

<210> 4635
<211> 14
<212> PRT
<213> Bos taurus

<400> 4635

Asn Leu Tyr Leu Thr Ile Pro Thr Ala Arg Ser Val Gly Ala
1 5 10

<210> 4636
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4636

Asn Arg Glu Arg Arg Gly Ile Ala Leu Asp Gly Lys Ile Lys His Glu
1 5 10 15

Asp Thr Asn Leu
20

<210> 4637
<211> 12
<212> PRT
<213> Homo sapiens

<400> 4637

Pro Thr Ala Arg Ser Val Gly Ala Ala Asp Gly Ser
1 5 10

<210> 4638
<211> 23
<212> PRT
<213> Bos taurus

<400> 4638

Pro Thr Ala Arg Ser Val Gly Ala Ala Asp Gly Ser Ser Trp Glu Gly
1 5 10 15

Val Gly Val Val Pro Asp Val
20

<210> 4639
<211> 14
<212> PRT
<213> Bos taurus

<400> 4639

Val Gly Ala Ala Asp Gly Ser Ser Trp Glu Gly Val Gly Val
1 5 10

<210> 4640
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4640

Tyr Gln Ile Lys Val Lys Leu Thr Val Ser Gly Phe Leu Gly Glu Leu
1 5 10 15

Thr Ser Ser Glu
20

<210> 4641
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4641

Leu Leu Ala Asn Asn Arg Glu Arg Arg Gly Ile Ala Leu Asp Gly Lys
1 5 10 15

Ile Lys His Glu
20

<210> 4642
<211> 16
<212> PRT
<213> Homo sapiens

<400> 4642

Asn Arg Glu Arg Arg Gly Ile Ala Leu Asp Gly Lys Ile Lys His Glu
1 5 10 15

<210> 4643
<211> 25
<212> PRT
<213> Homo sapiens

<400> 4643

Asp Lys Phe Val Ile Phe Leu Asp Val Lys His Phe Ser Pro Glu Asp
1 5 10 15

Leu Thr Val Lys Val Gln Asp Asp Phe
20 25

<210> 4644
<211> 25
<212> PRT
<213> Homo sapiens

<400> 4644

Gly Leu Asp Ala Thr His Ala Glu Arg Ala Ile Pro Val Ser Arg Glu
1 5 10 15

Glu Lys Pro Thr Ser Ala Pro Ser Ser

20 25

<210> 4645
<211> 25
<212> PRT
<213> Homo sapiens

<400> 4645

Gly Met Leu Thr Phe Cys Gly Pro Lys Ile Gln Thr Gly Leu Asp Ala
1 5 10 15

Thr His Ala Glu Arg Ala Ile Pro Val
20 25

<210> 4646
<211> 25
<212> PRT
<213> Homo sapiens

<400> 4646

Leu Ser Ser Asp Gly Val Leu Thr Val Asn Gly Pro Arg Lys Gln Val
1 5 10 15

Ser Gly Pro Glu Arg Thr Ile Pro Ile
20 25

<210> 4647
<211> 25
<212> PRT
<213> Homo sapiens

<400> 4647

Pro Glu Glu Leu Lys Val Lys Val Leu Gly Asp Val Ile Glu Val His
1 5 10 15

Gly Lys His Glu Glu Arg Gln Asp Glu
20 25

<210> 4648
<211> 25
<212> PRT
<213> Homo sapiens

<400> 4648

Arg Leu Glu Lys Asp Arg Phe Ser Val Asn Leu Asp Val Lys His Phe
1 5 10 15

Ser Pro Glu Glu Leu Lys Val Lys Val
20 25

<210> 4649
<211> 25
<212> PRT
<213> Homo sapiens

<400> 4649

Thr Val Lys Val Gln Asp Asp Phe Val Glu Ile His Gly Lys His Asn
1 5 10 15

Glu Arg Gln Asp Asp His Gly Tyr Ile
20 25

<210> 4650
<211> 14
<212> PRT
<213> Mus musculus

<400> 4650

Gln Thr Trp Glu Gly Ser Gly Val Leu Pro Cys Val Gly Thr
1 5 10

<210> 4651
<211> 20
<212> PRT
<213> Mus musculus

<400> 4651

Ser Tyr Ser Ser Ala Val Pro Leu Leu Cys Ser Tyr Phe Phe Glu Ala
1 5 10 15

Glu Pro Arg Gln
20

<210> 4652
<211> 20
<212> PRT
<213> Unknown

<220>
<223> epitope involved in autoimmune uvetisis

<400> 4652

Glu Asn Ser Asp Ser Asp Tyr Asp Arg Glu Ala Leu Gln Glu Arg Leu
1 5 10 15

Ala Lys Leu Ala
20

<210> 4653
<211> 20
<212> PRT
<213> Mycobacterium leprae

<400> 4653

Glu Asn Ser Asp Ser Asp Tyr Asp Arg Glu Lys Leu Gln Glu Arg Leu
1 5 10 15

Ala Lys Leu Ala
20

<210> 4654
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4654

Leu Ser Ser Val Val Val Asp Pro Ser Ile Arg His Phe Asp Val
1 5 10 15

<210> 4655
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4655

Asp Val Gly Glu Tyr Arg Ala Val Thr Glu Leu Gly Arg Pro Asp
1 5 10 15

<210> 4656
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4656

Asp Val Gly Val Tyr Arg Ala Val Thr Pro Gln Gly Arg Pro Asp
1 5 10 15

<210> 4657
<211> 14
<212> PRT
<213> Homo sapiens

<400> 4657

Gly Asn Arg Ile Ala Gln Trp Gln Ser Phe Gln Leu Glu Gly
1 5 10

<210> 4658
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4658

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

1 5 10 15

<210> 4659
<211> 31
<212> PRT
<213> Homo sapiens

<400> 4659

Val His Leu Thr Pro Glu Glu Lys Ser Ala Val Thr Ala Leu Trp Gly
1 5 10 15

Lys Val Asn Val Asp Glu Val Gly Gly Glu Ala Leu Gly Arg Leu
20 25 30

<210> 4660
<211> 11
<212> PRT
<213> Homo sapiens

<400> 4660

Val Leu Ser Pro Ala Asp Lys Thr Asn Val Lys
1 5 10

<210> 4661
<211> 31
<212> PRT
<213> Homo sapiens

<400> 4661

Val Leu Ser Pro Ala Asp Lys Thr Asn Val Lys Ala Ala Trp Gly Lys
1 5 10 15

Val Gly Ala His Ala Gly Glu Tyr Gly Ala Glu Ala Leu Glu Arg
20 25 30

<210> 4662
<211> 14
<212> PRT
<213> Homo sapiens

<400> 4662

Val Val Ala Gly Val Ala Asn Ala Leu Ala His Lys Tyr His
1 5 10

<210> 4663
<211> 19
<212> PRT
<213> Homo sapiens

<400> 4663

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

1 5 10 15

Ser Arg Ser

<210> 4664
<211> 11
<212> PRT
<213> Homo sapiens

<400> 4664

His Ala Arg Leu Arg Asp Ser Gly Arg Ala Tyr
1 5 10

<210> 4665
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4665

Cys Asn Glu Ser Ser Met Gln Ser Leu Arg Gln Arg Lys Ser Val Asn
1 5 10 15

Ala Leu Asn Ser
20

<210> 4666
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4666

Phe Gln Asp Thr His Asn Asn Ala His Tyr Tyr Val Phe Phe Glu Glu
1 5 10 15

Gln Glu Asp Glu
20

<210> 4667
<211> 19
<212> PRT
<213> Homo sapiens

<400> 4667

Gly Ile Phe Asn Thr Gly Leu Lys Met Phe Pro Asp Leu Thr Lys Val
1 5 10 15

Tyr Ser Thr

<210> 4668
<211> 16
<212> PRT
<213> Homo sapiens

<400> 4668

Gly Pro Ser Leu Leu Asp Val Ser Gln Thr Ser Val Thr Ala Leu Pro
1 5 10 15

<210> 4669
<211> 19
<212> PRT
<213> Homo sapiens

<400> 4669

Ile Gln Arg Ile Pro Ser Leu Pro Pro Ser Thr Gln Thr Leu Lys Leu
1 5 10 15

Ile Glu Thr

<210> 4670
<211> 19
<212> PRT
<213> Homo sapiens

<400> 4670

Ile Thr Asp Asn Pro Tyr Met Thr Ser Ile Pro Val Asn Ala Phe Gln
1 5 10 15

Gly Leu Cys

<210> 4671
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4671

Lys Asn Pro Gln Glu Glu Thr Leu Gln Ala Phe Asp Ser His Tyr Asp
1 5 10 15

Tyr Thr Ile Cys
20

<210> 4672
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4672

Leu Thr Arg Ala Asp Leu Ser Tyr Pro Ser His Cys Cys Ala Phe Lys
1 5 10 15

Asn Gln Lys Lys
20

<210> 4673
<211> 19
<212> PRT
<213> Homo sapiens

<400> 4673

Pro Asp Ala Leu Lys Glu Leu Pro Leu Leu Lys Phe Leu Gly Ile Phe
1 5 10 15

Asn Thr Gly

<210> 4674
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4674

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

Leu Ile Gly Ser
20

<210> 4675
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4675

Pro Tyr Glu Phe Ser Arg Lys Val Pro Thr Phe Ala Thr Pro Trp Pro
1 5 10 15

Asp Phe Val Pro
20

<210> 4676
<211> 19
<212> PRT
<213> Homo sapiens

<400> 4676

Thr Lys Val Tyr Ser Thr Asp Ile Phe Phe Ile Leu Glu Ile Thr Asp
1 5 10 15

Asn Pro Tyr

<210> 4677
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4677

Val Asn Ala Leu Asn Ser Pro Leu His Gln Glu Tyr Glu Glu Asn Leu
1 5 10 15

Gly Asp Ser Ile
20

<210> 4678
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4678

Ala Ser Arg Ser Val Ala Asp Lys Ile Leu Asp Leu Tyr Lys His Pro
1 5 10 15

Asp Asn Ile Asp
20

<210> 4679
<211> 12
<212> PRT
<213> Homo sapiens

<400> 4679

Asp Pro Leu Ile Arg Gly Leu Leu Ala Arg Pro Ala
1 5 10

<210> 4680
<211> 18
<212> PRT
<213> Homo sapiens

<400> 4680

Glu Pro Thr Ser Gly Val Ile Ala Arg Ala Ala Glu Ile Met Glu Thr
1 5 10 15

Ser Ile

<210> 4681
<211> 19

<212> PRT
<213> Homo sapiens

<400> 4681

Phe Gln Gln Tyr Val Gly Pro Tyr Glu Gly Tyr Asp Ser Thr Ala Asn
1 5 10 15

Pro Thr Val

<210> 4682
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4682

His Gly Leu Pro Gly Tyr Asn Glu Trp Arg Glu Phe Cys Gly Leu Pro
1 5 10 15

Arg Leu Glu Thr
20

<210> 4683
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4683

His Pro Asp Asn Ile Asp Val Trp Leu Gly Gly Leu Ala Glu Asn Phe
1 5 10 15

Leu Pro Arg Ala
20

<210> 4684
<211> 18
<212> PRT
<213> Homo sapiens

<400> 4684

His Trp Ser Ala Asp Ala Val Tyr Gln Glu Ala Arg Lys Val Val Gly
1 5 10 15

Ala Leu

<210> 4685
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4685

Ile Pro Gly Met Met Leu Glu Ala Trp Arg Glu Thr Phe Pro Gln Asp
1 5 10 15

Asp Lys Cys Gly
20

<210> 4686
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4686

Lys Phe Pro Glu Asp Phe Glu Ser Cys Asp Ser Ile Pro Gly Met Met
1 5 10 15

Leu Glu Ala Trp
20

<210> 4687
<211> 19
<212> PRT
<213> Homo sapiens

<400> 4687

Lys Val Val Gly Ala Leu His Gln Ile Ile Thr Leu Arg Asp Tyr Ile
1 5 10 15

Pro Arg Ile

<210> 4688
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4688

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

Trp Glu Asn Ser
20

<210> 4689
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4689

Leu Pro Arg Leu Glu Thr Pro Ala Asp Leu Ser Thr Ala Ile Ala Ser

1 5 10 15

Arg Ser Val Ala
20

<210> 4690
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4690

Asn Phe Leu Pro Arg Ala Arg Thr Gly Pro Leu Phe Ala Cys Leu Ile
1 5 10 15

Gly Lys Gln Met
20

<210> 4691
<211> 18
<212> PRT
<213> Homo sapiens

<400> 4691

Asn Arg Leu Ala Ala Ala Leu Lys Ala Leu Asn Ala His Trp Ser Ala
1 5 10 15

Asp Ala

<210> 4692
<211> 18
<212> PRT
<213> Homo sapiens

<400> 4692

Arg Asp Tyr Ile Pro Arg Ile Leu Gly Pro Glu Ala Phe Gln Gln Tyr
1 5 10 15

Val Gly

<210> 4693
<211> 13
<212> PRT
<213> Homo sapiens

<400> 4693

Arg Gly Leu Leu Ala Arg Pro Ala Lys Leu Gln Val Gln
1 5 10

<210> 4694
<211> 18
<212> PRT
<213> Homo sapiens

<400> 4694

Thr Ala Ala Phe Arg Phe Gly His Ala Thr Ile His Pro Leu Val Arg
1 5 10 15

Arg Leu

<210> 4695
<211> 933
<212> PRT
<213> Homo sapiens

<400> 4695

Met Arg Ala Leu Ala Val Leu Ser Val Thr Leu Val Met Ala Cys Thr
1 5 10 15

Glu Ala Phe Phe Pro Phe Ile Ser Arg Gly Lys Glu Leu Leu Trp Gly
20 25 30

Lys Pro Glu Glu Ser Arg Val Ser Ser Val Leu Glu Glu Ser Lys Arg
35 40 45

Leu Val Asp Thr Ala Met Tyr Ala Thr Met Gln Arg Asn Leu Lys Lys
50 55 60

Arg Gly Ile Leu Ser Pro Ala Gln Leu Leu Ser Phe Ser Lys Leu Pro
65 70 75 80

Glu Pro Thr Ser Gly Val Ile Ala Arg Ala Ala Glu Ile Met Glu Thr
85 90 95

Ser Ile Gln Ala Met Lys Arg Lys Val Asn Leu Lys Thr Gln Gln Ser
100 105 110

Gln His Pro Thr Asp Ala Leu Ser Glu Asp Leu Leu Ser Ile Ile Ala
115 120 125

Asn Met Ser Gly Cys Leu Pro Tyr Met Leu Pro Pro Lys Cys Pro Asn
130 135 140

Thr Cys Leu Ala Asn Lys Tyr Arg Pro Ile Thr Gly Ala Cys Asn Asn
145 150 155 160

Arg Asp His Pro Arg Trp Gly Ala Ser Asn Thr Ala Leu Ala Arg Trp

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                165                 170                 175

Leu Pro Pro Val Tyr Glu Asp Gly Phe Ser Gln Pro Arg Gly Trp Asn
            180                 185                 190

Pro Gly Phe Leu Tyr Asn Gly Phe Pro Leu Pro Pro Val Arg Glu Val
        195                 200                 205

Thr Arg His Val Ile Gln Val Ser Asn Glu Val Val Thr Asp Asp Asp
    210                 215                 220

Arg Tyr Ser Asp Leu Leu Met Ala Trp Gly Gln Tyr Ile Asp His Asp
225                 230                 235                 240

Ile Ala Phe Thr Pro Gln Ser Thr Ser Lys Ala Ala Phe Gly Gly Gly
                245                 250                 255

Ala Asp Cys Gln Met Thr Cys Glu Asn Gln Asn Pro Cys Phe Pro Ile
            260                 265                 270

Gln Leu Pro Glu Glu Ala Arg Pro Ala Ala Gly Thr Ala Cys Leu Pro
        275                 280                 285

Phe Tyr Arg Ser Ser Ala Ala Cys Gly Thr Gly Asp Gln Gly Ala Leu
    290                 295                 300

Phe Gly Asn Leu Ser Thr Ala Asn Pro Arg Gln Gln Met Asn Gly Leu
305                 310                 315                 320

Thr Ser Phe Leu Asp Ala Ser Thr Val Tyr Gly Ser Ser Pro Ala Leu
                325                 330                 335

Glu Arg Gln Leu Arg Asn Trp Thr Ser Ala Glu Gly Leu Leu Arg Val
            340                 345                 350

His Ala Arg Leu Arg Asp Ser Gly Arg Ala Tyr Leu Pro Phe Val Pro
        355                 360                 365

Pro Arg Ala Pro Ala Ala Cys Ala Pro Glu Pro Gly Ile Pro Gly Glu
    370                 375                 380

Thr Arg Gly Pro Cys Phe Leu Ala Gly Asp Gly Arg Ala Ser Glu Val
385                 390                 395                 400

Pro Ser Leu Thr Ala Leu His Thr Leu Trp Leu Arg Glu His Asn Arg
                405                 410                 415
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Leu Ala Ala Ala Leu Lys Ala Leu Asn Ala His Trp Ser Ala Asp Ala
            420                 425                 430

Val Tyr Gln Glu Ala Arg Lys Val Val Gly Ala Leu His Gln Ile Ile
        435                 440                 445

Thr Leu Arg Asp Tyr Ile Pro Arg Ile Leu Gly Pro Glu Ala Phe Gln
    450                 455                 460

Gln Tyr Val Gly Pro Tyr Glu Gly Tyr Asp Ser Thr Ala Asn Pro Thr
465                 470                 475                 480

Val Ser Asn Val Phe Ser Thr Ala Ala Phe Arg Phe Gly His Ala Thr
                485                 490                 495

Ile His Pro Leu Val Arg Arg Leu Asp Ala Ser Phe Gln Glu His Pro
            500                 505                 510

Asp Leu Pro Gly Leu Trp Leu His Gln Ala Phe Phe Ser Pro Trp Thr
        515                 520                 525

Leu Leu Arg Gly Gly Gly Leu Asp Pro Leu Ile Arg Gly Leu Leu Ala
    530                 535                 540

Arg Pro Ala Lys Leu Gln Val Gln Asp Gln Leu Met Asn Glu Glu Leu
545                 550                 555                 560

Thr Glu Arg Leu Phe Val Leu Ser Asn Ser Ser Thr Leu Asp Leu Ala
                565                 570                 575

Ser Ile Asn Leu Gln Arg Gly Arg Asp His Gly Leu Pro Gly Tyr Asn
            580                 585                 590

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

Leu Ser Thr Ala Ile Ala Ser Arg Ser Val Ala Asp Lys Ile Leu Asp
    610                 615                 620

Leu Tyr Lys His Pro Asp Asn Ile Asp Val Trp Leu Gly Gly Leu Ala
625                 630                 635                 640

Glu Asn Phe Leu Pro Arg Ala Arg Thr Gly Pro Leu Phe Ala Cys Leu
                645                 650                 655

Ile Gly Lys Gln Met Lys Ala Leu Arg Asp Gly Asp Trp Phe Trp Trp
            660                 665                 670
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Glu Asn Ser His Val Phe Thr Asp Ala Gln Arg Arg Glu Leu Glu Lys
        675                 680                 685

His Ser Leu Ser Arg Val Ile Cys Asp Asn Thr Gly Leu Thr Arg Val
    690                 695                 700

Pro Met Asp Ala Phe Gln Val Gly Lys Phe Pro Glu Asp Phe Glu Ser
705                 710                 715                 720

Cys Asp Ser Ile Thr Gly Met Asn Leu Glu Ala Trp Arg Glu Thr Phe
                725                 730                 735

Pro Gln Asp Asp Lys Cys Gly Phe Pro Glu Ser Val Glu Asn Gly Asp
            740                 745                 750

Phe Val His Cys Glu Glu Ser Gly Arg Arg Val Leu Val Tyr Ser Cys
        755                 760                 765

Arg His Gly Tyr Glu Leu Gln Gly Arg Glu Gln Leu Thr Cys Thr Gln
    770                 775                 780

Glu Gly Trp Asp Phe Gln Pro Pro Leu Cys Lys Asp Val Asn Glu Cys
785                 790                 795                 800

Ala Asp Gly Ala His Pro Pro Cys His Ala Ser Ala Arg Cys Arg Asn
                805                 810                 815

Thr Lys Gly Gly Phe Gln Cys Leu Cys Ala Asp Pro Tyr Glu Leu Gly
            820                 825                 830

Asp Asp Gly Arg Thr Cys Val Asp Ser Gly Arg Leu Pro Arg Val Thr
        835                 840                 845

Trp Ile Ser Met Ser Leu Ala Ala Leu Leu Ile Gly Gly Phe Ala Gly
    850                 855                 860

Leu Thr Ser Thr Val Ile Cys Arg Trp Thr Arg Thr Gly Thr Lys Ser
865                 870                 875                 880

Thr Leu Pro Ile Ser Glu Thr Gly Gly Gly Thr Pro Glu Leu Arg Cys
                885                 890                 895

Gly Lys His Gln Ala Val Gly Thr Ser Pro Gln Arg Ala Ala Ala Gln
            900                 905                 910

Asp Ser Glu Gln Glu Ser Ala Gly Met Glu Gly Arg Asp Thr His Arg
        915                 920                 925
```

Leu Pro Arg Ala Leu
    930

<210> 4696
<211> 26
<212> PRT
<213> Homo sapiens

<400> 4696

Asp Asn Thr Gly Leu Thr Arg Val Pro Met Asp Ala Phe Gln Val Gly
1   5   10   15

Lys Phe Pro Glu Asp Phe Glu Ser Cys Asp
            20   25

<210> 4697
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4697

Asp Ser His Tyr Asp Tyr Thr Ile Cys Gly Asp Ser Glu Asp Met Val
1   5   10   15

Cys Thr Pro Lys
            20

<210> 4698
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4698

Phe Gln Gly Leu Cys Asn Glu Thr Leu Thr Leu Lys Leu Tyr Asn Asn
1   5   10   15

Gly Phe Thr Ser
            20

<210> 4699
<211> 33
<212> PRT
<213> Homo sapiens

<400> 4699

Gly Tyr Asn Glu Trp Arg Glu Phe Cys Gly Leu Pro Arg Leu Glu Thr
1   5   10   15

Pro Ala Asp Leu Ser Thr Ala Ile Ala Ser Arg Ser Val Ala Asp Lys

20 25 30

Ile

<210> 4700
<211> 45
<212> PRT
<213> Homo sapiens

<400> 4700

Ile Asn Leu Gln Arg Gly Arg Asp His Gly Leu Pro Gly Tyr Asn Glu
1 5 10 15

Trp Arg Glu Phe Cys Gly Leu Pro Arg Leu Glu Thr Pro Ala Asp Leu
20 25 30

Ser Thr Ala Ile Ala Ser Arg Ser Val Ala Asp Lys Ile
35 40 45

<210> 4701
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4701

Ile Arg Gly Ile Leu Glu Ser Leu Met Cys Asn Glu Ser Ser Met Gln
1 5 10 15

Ser Leu Arg Gln
20

<210> 4702
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4702

Lys Leu Pro Leu Ser Leu Ser Phe Leu His Leu Thr Arg Ala Asp Leu
1 5 10 15

Ser Tyr Pro Ser
20

<210> 4703
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4703

Leu Asp Ala Val Tyr Leu Asn Lys Asn Lys Tyr Leu Thr Val Ile Asp
1 5 10 15

Lys Asp Ala Phe
20

<210> 4704
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4704

Leu His Gln Glu Tyr Glu Glu Asn Leu Gly Asp Ser Ile Val Gly Tyr
1 5 10 15

Lys Glu Lys Ser
20

<210> 4705
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4705

Asn Gly Phe Thr Ser Val Gln Gly Tyr Ala Phe Asn Gly Thr Lys Leu
1 5 10 15

Asp Ala Val Tyr
20

<210> 4706
<211> 13
<212> PRT
<213> Homo sapiens

<400> 4706

Gln Val Gly Lys Phe Pro Glu Asp Phe Glu Ser Cys Asp
1 5 10

<210> 4707
<211> 12
<212> PRT
<213> Homo sapiens

<400> 4707

Ser Thr Asp Asp Tyr Ala Ser Phe Ser Arg Ala Leu
1 5 10

<210> 4708
<211> 20
<212> PRT

<213> Homo sapiens

<400> 4708

Tyr Val Ser Ile Asp Val Thr Leu Gln Gln Leu Glu Ser His Ser Phe
1 5 10 15

Tyr Asn Leu Ser
20

<210> 4709
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4709

Tyr Tyr Val Phe Phe Glu Glu Gln Glu Asp Glu Ile Ile Gly Phe Gly
1 5 10 15

Gln Glu Leu Lys
20

<210> 4710
<211> 21
<212> PRT
<213> Homo sapiens

<400> 4710

Asp Leu Tyr Thr His Ser Glu Tyr Tyr Asn His Ala Ile Asp Trp Gln
1 5 10 15

Thr Gly Pro Gly Cys
20

<210> 4711
<211> 19
<212> PRT
<213> Mus musculus

<400> 4711

Asn Thr Thr Asp Met Met Ile Phe Asp Leu Ile His Asn Tyr Asn Arg
1 5 10 15

Phe Pro Asp

<210> 4712
<211> 16
<212> PRT
<213> Homo sapiens

<400> 4712

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Tyr Ala Phe Asn Gly Thr Lys Leu Asp Ala Val Tyr Leu Asn Lys Asn
1               5                   10                  15


<210>  4713
<211>  11
<212>  PRT
<213>  Homo sapiens

<400>  4713

Asn Lys Pro Leu Ile Thr Val Thr Asn Ser Lys
1               5                   10


<210>  4714
<211>  9
<212>  PRT
<213>  Rattus norvegicus

<400>  4714

Pro Pro Gly Glu Gln Thr Met Gly Val
1               5


<210>  4715
<211>  20
<212>  PRT
<213>  Homo sapiens

<400>  4715

Val Cys Thr Pro Lys Ser Asp Glu Phe Asn Pro Cys Glu Asp Ile Met
1               5                   10                  15


Gly Tyr Lys Phe
            20


<210>  4716
<211>  50
<212>  PRT
<213>  Homo sapiens

<400>  4716

Ala Thr Lys Lys Glu Glu Glu Lys Lys Gly Gly Asp Arg Asn Thr Gly
1               5                   10                  15


Leu Ser Arg Asp Lys Asp Lys Lys Arg Glu Glu Met Lys Glu Val Ala
            20                  25                  30


Lys Lys Glu Asp Asp Glu Lys Val Lys Gly Glu Arg Arg Asn Thr Asp
        35                  40                  45


Thr Arg
    50
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<210> 4717
<211> 39
<212> PRT
<213> Homo sapiens

<400> 4717

Leu Leu Lys Glu Asn Thr Ser Leu Leu Lys Leu Gly Tyr His Phe Glu
1 5 10 15

Leu Ala Gly Pro Arg Met Thr Val Thr Asn Leu Leu Ser Arg Asn Met
20 25 30

Asp Lys Gln Arg Gln Lys Arg
35

<210> 4718
<211> 37
<212> PRT
<213> Homo sapiens

<400> 4718

Arg Gly Arg Asp Ala Ser Lys Lys Ala Leu Gly Pro Arg Arg Asn Ser
1 5 10 15

Asp Leu Gly Lys Glu Pro Lys Arg Gly Gly Leu Lys Lys Ser Phe Ser
20 25 30

Arg Asp Arg Asp Glu
35

<210> 4719
<211> 27
<212> PRT
<213> Homo sapiens

<400> 4719

Ala Asp Leu Ser Thr Ala Ile Ala Ser Arg Ser Val Ala Asp Lys Ile
1 5 10 15

Leu Asp Leu Tyr Lys His Pro Asp Asn Ile Asp
20 25

<210> 4720
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4720

Ala Phe Gln Val Gly Lys Phe Pro Glu Asp Phe Glu Ser Cys Asp Ser

1 5 10 15

Ile Pro Gly Met
20

<210> 4721
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4721

Ala His Pro Pro Cys His Ala Ser Ala Arg Cys Arg Asn Thr Lys Gly
1 5 10 15

Gly Phe Gln Cys
20

<210> 4722
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4722

Ala Leu Lys Ala Leu Asn Ala His Trp Ser Ala Asp Ala Val Tyr Gln
1 5 10 15

Glu Ala Arg Lys
20

<210> 4723
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4723

Ala Pro Glu Pro Gly Ile Pro Gly Glu Thr Arg Gly Pro Cys Phe Leu
1 5 10 15

Ala Gly Asp Gly
20

<210> 4724
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4724

Asp Pro Leu Ile Arg Gly Leu Leu Ala Arg Pro Ala Lys Leu Gln Val
1 5 10 15

Gln Asp Gln Leu
20

<210> 4725
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4725

Glu Glu Ser Gly Arg Arg Val Leu Val Tyr Ser Cys Arg His Gly Tyr
1 5 10 15

Glu Leu Gln Gly
20

<210> 4726
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4726

Glu Gly Trp Asp Phe Gln Pro Pro Leu Cys Lys Asp Val Asn Glu Cys
1 5 10 15

Ala Asp Gly Ala
20

<210> 4727
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4727

Glu Ser Arg Val Ser Ser Val Leu Glu Glu Ser Lys Arg Leu Val Asp
1 5 10 15

Thr Ala Met Tyr
20

<210> 4728
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4728

Phe Ser Lys Leu Pro Glu Pro Thr Ser Gly Val Ile Ala Arg Ala Ala
1 5 10 15

Glu Ile Met Glu
20

<210> 4729
<211> 21
<212> PRT
<213> Homo sapiens

<400> 4729

Gly Gly Ala Asp Cys Gln Met Thr Cys Glu Asn Gln Asn Pro Cys Phe
1 5 10 15

Pro Ile Gln Leu Pro
20

<210> 4730
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4730

Gly Leu Trp Leu His Gln Ala Phe Phe Ser Pro Trp Thr Leu Leu Arg
1 5 10 15

Gly Gly Gly Leu
20

<210> 4731
<211> 21
<212> PRT
<213> Homo sapiens

<400> 4731

Gly Met Asn Leu Glu Ala Trp Arg Glu Thr Phe Pro Asp Gln Asp Asp
1 5 10 15

Lys Cys Gly Phe Pro
20

<210> 4732
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4732

Gly Arg Leu Pro Arg Ala Thr Trp Ile Ser Met Ser Leu Ala Ala Leu
1 5 10 15

Leu Ile Gly Gly
20

<210> 4733
<211> 20

<212> PRT
<213> Homo sapiens

<400> 4733

His Ser Leu Ser Arg Val Ile Cys Asp Asn Thr Gly Leu Thr Arg Val
1 5 10 15

Pro Met Asp Ala
20

<210> 4734
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4734

His Val Ile Gln Val Ser Asn Glu Val Val Thr Asp Asp Asp Arg Tyr
1 5 10 15

Ser Asp Leu Leu
20

<210> 4735
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4735

Lys Cys Pro Asn Thr Cys Leu Ala Asn Lys Tyr Arg Pro Ile Thr Gly
1 5 10 15

Ala Cys Asn Asn
20

<210> 4736
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4736

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

Lys His Gln Ala
20

<210> 4737
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4737

Met Glu Thr Ser Ile Gln Ala Met Lys Arg Lys Val Asn Leu Lys Thr
1 5 10 15

Gln Gln Ser Gln
20

<210> 4738
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4738

Asn Glu Trp Arg Glu Phe Cys Gly Leu Pro Arg Leu Glu Thr Pro Ala
1 5 10 15

Asp Leu Ser Thr
20

<210> 4739
<211> 22
<212> PRT
<213> Homo sapiens

<400> 4739

Asn Glu Trp Arg Glu Phe Cys Gly Leu Pro Arg Leu Glu Thr Pro Ala
1 5 10 15

Asp Leu Ser Thr Ala Ile
20

<210> 4740
<211> 12
<212> PRT
<213> Homo sapiens

<400> 4740

Asn Ile Phe Glu Tyr Gln Val Asp Ala Gln Pro Leu
1 5 10

<210> 4741
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4741

Pro Cys Phe Leu Ala Gly Asp Gly Arg Ala Ser Glu Val Pro Ser Leu
1 5 10 15

Thr Ala Leu His

20

<210> 4742
<211> 25
<212> PRT
<213> Homo sapiens

<400> 4742

Pro Gly Tyr Asn Glu Trp Arg Glu Phe Cys Gly Leu Pro Arg Leu Glu
1 5 10 15

Thr Pro Ala Asp Leu Ser Thr Ala Ile
20 25

<210> 4743
<211> 45
<212> PRT
<213> Homo sapiens

<400> 4743

Pro Gly Tyr Asn Glu Trp Arg Glu Phe Cys Gly Leu Pro Arg Leu Glu
1 5 10 15

Thr Pro Ala Asp Leu Ser Thr Ala Ile Ala Ser Arg Ser Val Ala Asp
20 25 30

Lys Ile Leu Asp Leu Tyr Lys His Pro Asp Asn Ile Asp
35 40 45

<210> 4744
<211> 18
<212> PRT
<213> Homo sapiens

<400> 4744

Gln Glu Ser Ala Gly Met Glu Gly Arg Asp Thr His Arg Leu Pro Arg
1 5 10 15

Ala Leu

<210> 4745
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4745

Gln Gln Ser Gln His Pro Thr Asp Ala Leu Ser Glu Asp Leu Leu Ser
1 5 10 15

Ile Ile Ala Asn
            20

<210> 4746
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4746

Gln Arg Asn Leu Lys Lys Arg Gly Ile Leu Ser Pro Ala Gln Leu Leu
1   5   10   15

Ser Phe Ser Lys
            20

<210> 4747
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4747

Arg Pro Ile Thr Gly Ala Cys Asn Asn Arg Asp His Pro Arg Trp Gly
1   5   10   15

Ala Ser Asn Thr
            20

<210> 4748
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4748

Thr Glu Ala Phe Phe Pro Phe Ile Ser Arg Gly Lys Glu Leu Leu Trp
1   5   10   15

Gly Lys Pro Glu
            20

<210> 4749
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4749

Val Gly Pro Tyr Glu Gly Tyr Asp Ser Thr Ala Asn Pro Thr Val Ser
1   5   10   15

Asn Val Phe Ser
            20

<210> 4750
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4750

Tyr Glu Asp Gly Phe Ser Gln Pro Arg Gly Trp Asn Pro Gly Phe Leu
1 5 10 15

Tyr Asn Gly Phe
20

<210> 4751
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4751

Tyr Glu Leu Gln Gly Arg Glu Gln Leu Thr Cys Thr Gln Glu Gly Trp
1 5 10 15

Asp Phe Gln Pro
20

<210> 4752
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4752

Ala Leu Lys Ala Leu Asn Ala His Trp Ser Ala Asp Ala Val Tyr
1 5 10 15

<210> 4753
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4753

Ala Met Lys Arg Lys Val Asn Leu Lys Thr Gln Gln Ser Gln His Pro
1 5 10 15

Thr Asp Ala Leu
20

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<400> 4754

Gly Leu Pro Arg Leu Glu Thr Pro Ala Asp Leu Ser Thr Ala Ile Ala
1 5 10 15

Ser Arg

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<400> 4755

His Pro Thr Asp Ala Leu Ser Glu Asp Leu Leu Ser Ile
1 5 10

<210> 4756
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<212> PRT
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<400> 4756

His Val Ile Gln Val Ser Asn Glu Val Val Thr Asp Asp
1 5 10

<210> 4757
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<400> 4757

Ile Ala Ser Arg Ser Val Ala Asp Lys Ile Leu Asp Leu Tyr Lys
1 5 10 15

<210> 4758
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<400> 4758

Leu Tyr Lys His Pro Asp Asn Ile Asp Val Trp Leu Gly Gly Leu Ala
1 5 10 15

Glu Asn Phe Leu
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<210> 4759
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<212> PRT
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<400> 4759

Met Thr Cys Glu Asn Gln Asn Pro Cys Phe Pro Ile Gln Leu Pro
1 5 10 15

<210> 4760
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<400> 4760

Val Gly Ala Leu His Gln Ile Ile Thr Leu Arg Asp Tyr Ile Pro Arg
1 5 10 15

Ile Leu

<210> 4761
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<400> 4761

Leu Val Val Tyr Pro Trp Thr Gln Arg Phe
1 5 10

<210> 4762
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<400> 4762

Ala Ala Gly Leu Leu Ser Thr Tyr Arg Ala Phe Leu Ser Ser His
1 5 10 15

<210> 4763
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<400> 4763

Ala Ala His Leu Pro Ala Glu Phe Thr Pro Ala Val His Ala Ser Leu
1 5 10 15

Asp Lys Phe Leu Ala Ser Val Ser Thr Val Leu
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<400> 4764

Ala Ala His Leu Pro Ala Glu Phe Thr Pro Ala Val His Ala Ser Leu
1 5 10 15

Asp Lys Phe Leu Ala Ser Val Ser Thr Val Leu Thr Ser Lys Tyr Arg
20 25 30

<210> 4765
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<213> Homo sapiens

<400> 4765

Ala Ala Trp Gly Lys Val Gly Ala His Ala Gly Glu Tyr Gly Ala Glu
1 5 10 15

Ala Leu Glu Arg Met
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<210> 4766
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<400> 4766

Ala Ala Trp Gly Lys Val Gly Ala His Ala Gly Glu Tyr Gly Ala Glu
1 5 10 15

Ala Leu Glu Arg Met Phe Leu Ser Phe Pro Thr Thr Lys
20 25

<210> 4767
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<400> 4767

Ala Phe Thr Pro Glu Gly Glu Arg Leu Ile Gly Asp Ala Ala Lys Asn
1 5 10 15

Gln Leu Thr

<210> 4768
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<400> 4768

Ala Gly Leu Leu Ser Thr Tyr Arg Ala Phe Leu Ser Ser His
1 5 10

<210> 4769
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<212> PRT
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<400> 4769

Ala Gly Asn Leu Gly Gly Gly Val Val Thr Ile Glu Arg Ser Lys
1 5 10 15

<210> 4770
<211> 15
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<400> 4770

Ala His Leu Leu Ile Leu Arg Asp Thr Lys Thr Tyr Met Leu Ala
1 5 10 15

<210> 4771
<211> 16
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<400> 4771

Ala His Leu Leu Ile Leu Arg Asp Thr Lys Thr Tyr Met Leu Ala Phe
1 5 10 15

<210> 4772
<211> 13
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<400> 4772

Ala Lys Ala Val Lys Gln Phe Glu Glu Ser Gln Gly Arg
1 5 10

<210> 4773
<211> 17
<212> PRT
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<400> 4773

Ala Lys Ala Val Lys Gln Phe Glu Glu Ser Gln Gly Arg Thr Ser Ser
1 5 10 15

Lys

<210> 4774
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<212> PRT
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<400> 4774

Ala Lys Phe Glu Glu Leu Asn Met Asp Leu Phe Arg
1 5 10

<210> 4775
<211> 18
<212> PRT
<213> Homo sapiens

<400> 4775

Ala Lys Val Ala Val Leu Gly Ala Ser Gly Gly Ile Gly Gln Pro Leu
1 5 10 15

Ser Leu

<210> 4776
<211> 16
<212> PRT
<213> Homo sapiens

<400> 4776

Ala Ser Gly Asn Tyr Ala Thr Val Ile Ser His Asn Pro Glu Thr Lys
1 5 10 15

<210> 4777
<211> 12
<212> PRT
<213> Homo sapiens

<400> 4777

Ala Ser Val Ser Thr Val Leu Thr Ser Lys Tyr Arg
1 5 10

<210> 4778
<211> 16
<212> PRT
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<400> 4778

Ala Val Pro Ser Pro Pro Pro Ala Ser Pro Arg Ser Gln Tyr Asn Phe
1 5 10 15

<210> 4779
<211> 19
<212> PRT
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<400> 4779

Ala Val Pro Ser Pro Pro Pro Ala Ser Pro Arg Ser Gln Tyr Asn Phe
1 5 10 15

Ile Ala Asp

<210> 4780
<211> 24
<212> PRT
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<400> 4780

Ala Val Thr Glu Leu Gly Arg Pro Asp Ala Glu Tyr Trp Asn Ser Gln
1 5 10 15

Lys Asp Leu Leu Glu Gln Lys Arg
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<210> 4781
<211> 17
<212> PRT
<213> Homo sapiens

<400> 4781

Ala Tyr Val Arg Leu Ala Pro Asp Tyr Asp Ala Leu Asp Val Ala Asn
1 5 10 15

Lys

<210> 4782
<211> 18
<212> PRT
<213> Homo sapiens

<400> 4782

Asp Gly Arg Gly Ala Leu Gln Asn Ile Ile Pro Ala Ser Thr Gly Ala
1 5 10 15

Ala Lys

<210> 4783
<211> 13
<212> PRT
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<400> 4783

Asp Gly Val Ile Lys Val Phe Asn Asp Met Lys Val Arg
1 5 10

<210> 4784
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4784

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

<210> 4785
<211> 16
<212> PRT
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<400> 4785

Asp Lys Phe Leu Ala Ser Val Ser Thr Val Leu Thr Ser Lys Tyr Arg
1 5 10 15

<210> 4786
<211> 18
<212> PRT
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<400> 4786

Asp Pro Ser Pro Ser Pro Val Leu Gly Tyr Lys Ile Val Tyr Lys Pro
1 5 10 15

Val Gly

<210> 4787
<211> 10
<212> PRT
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<400> 4787

Asp Arg Val Tyr Ile His Pro Phe His Leu
1 5 10

<210> 4788
<211> 13
<212> PRT
<213> Homo sapiens

<400> 4788

Asp Thr Asn Ala Asp Lys Gln Leu Ser Phe Glu Glu Phe
1 5 10

<210> 4789
<211> 16

<212> PRT
<213> Homo sapiens

<400> 4789

Asp Val Pro Lys Trp Ile Ser Ile Met Thr Glu Arg Ser Val Pro His
1 5 10 15

<210> 4790
<211> 12
<212> PRT
<213> Homo sapiens

<400> 4790

Glu Asp Phe Arg Asp Gly Leu Lys Leu Met Leu Leu
1 5 10

<210> 4791
<211> 14
<212> PRT
<213> Homo sapiens

<400> 4791

Glu Asp Ile Val Ala Asp His Val Ala Ser Tyr Gly Val Asn
1 5 10

<210> 4792
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4792

Glu Gly Leu Thr Phe Gln Met Lys Lys Asn Ala Glu Glu Leu Lys
1 5 10 15

<210> 4793
<211> 11
<212> PRT
<213> Homo sapiens

<400> 4793

Glu Ile Thr Ala Leu Ala Pro Ser Thr Met Lys
1 5 10

<210> 4794
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4794

Glu Gln Phe Tyr Val Asp Leu Asp Lys Lys Glu Thr Val Trp His
1 5 10 15

<210> 4795
<211> 14
<212> PRT
<213> Homo sapiens

<400> 4795

Phe Asp Pro Ile Ile Glu Asp Arg His Gly Gly Tyr Lys Pro
1 5 10

<210> 4796
<211> 15
<212> PRT
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<400> 4796

Phe Asp Pro Ile Ile Glu Asp Arg His Gly Gly Tyr Lys Pro Ser
1 5 10 15

<210> 4797
<211> 11
<212> PRT
<213> Homo sapiens

<400> 4797

Phe Asp Ser Asp Val Gly Glu Tyr Arg Ala Val
1 5 10

<210> 4798
<211> 18
<212> PRT
<213> Homo sapiens

<400> 4798

Phe Glu Ser Phe Gly Asp Leu Ser Thr Pro Asp Ala Val Met Gly Asn
1 5 10 15

Pro Lys

<210> 4799
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4799

Phe Glu Ser Phe Gly Asp Leu Ser Thr Pro Asp Ala Val Met Gly Asn
1 5 10 15

Pro Lys Val Lys
20

<210> 4800
<211> 14
<212> PRT
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<400> 4800

Phe Leu Ala Ser Val Ser Thr Val Leu Thr Ser Lys Tyr Arg
1 5 10

<210> 4801
<211> 10
<212> PRT
<213> Homo sapiens

<400> 4801

Phe Leu Glu Asn Val Ile Arg Asp Ala Val
1 5 10

<210> 4802
<211> 24
<212> PRT
<213> Homo sapiens

<400> 4802

Phe Leu Ser Phe Pro Thr Thr Lys Thr Tyr Phe Pro His Phe Asp Leu
1 5 10 15

Ser His Gly Ser Ala Gln Val Lys
20

<210> 4803
<211> 28
<212> PRT
<213> Homo sapiens

<400> 4803

Phe Leu Ser Phe Pro Thr Thr Lys Thr Tyr Phe Pro His Phe Asp Leu
1 5 10 15

Ser His Gly Ser Ala Gln Val Lys Gly His Gly Lys
20 25

<210> 4804
<211> 29
<212> PRT
<213> Homo sapiens

<400> 4804

Phe Leu Ser Phe Pro Thr Thr Lys Thr Tyr Phe Pro His Phe Asp Leu
1 5 10 15

Ser His Gly Ser Ala Gln Val Lys Gly His Gly Lys Lys
20 25

<210> 4805
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4805

Gly Ala Pro Ala Ala Ala Thr Ala Pro Ala Pro Thr Ala His Lys
1 5 10 15

<210> 4806
<211> 15
<212> PRT
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<400> 4806

Gly Glu Leu Glu Lys Glu Glu Ala Gln Pro Ile Val Thr Lys Tyr
1 5 10 15

<210> 4807
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4807

Gly Gly Glu Leu Arg Phe Thr Val Thr Gln Arg Ser Gln Pro Gly
1 5 10 15

<210> 4808
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4808

Gly Lys Glu Tyr Phe Ala Ile Asp Asn Ser Gly Arg Ile Ile Thr
1 5 10 15

<210> 4809
<211> 12
<212> PRT
<213> Homo sapiens

<400> 4809

Gly Leu Thr Phe Gln Met Lys Lys Asn Ala Glu Glu
1 5 10

<210> 4810
<211> 14
<212> PRT

<213> Homo sapiens

<400> 4810

Gly Leu Thr Phe Gln Met Lys Lys Asn Ala Glu Glu Leu Lys
1 5 10

<210> 4811
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4811

Gly Asn Arg Ile Ala Gln Trp Gln Ser Phe Gln Leu Glu Gly Gly
1 5 10 15

<210> 4812
<211> 18
<212> PRT
<213> Homo sapiens

<400> 4812

Gly Arg Met His Ala Pro Gly Lys Gly Leu Ser Gln Ser Ala Leu Pro
1 5 10 15

Tyr Arg

<210> 4813
<211> 14
<212> PRT
<213> Homo sapiens

<400> 4813

Gly Thr Leu Ile Ile Arg Asp Val Lys Glu Ser Asp Gln Gly
1 5 10

<210> 4814
<211> 17
<212> PRT
<213> Homo sapiens

<400> 4814

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

Thr

<210> 4815
<211> 12
<212> PRT

<213> Homo sapiens

<400> 4815

Ile Gly Ser Ser Gln Asp Asp Gly Leu Ile Asn Arg
1 5 10

<210> 4816
<211> 16
<212> PRT
<213> Homo sapiens

<400> 4816

Ile Gly Ser Ser Tyr Phe Pro Glu His Gly Tyr Phe Arg Ala Pro Glu
1 5 10 15

<210> 4817
<211> 9
<212> PRT
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<400> 4817

Ile Lys Glu Glu Ser Lys Thr Ala Val
1 5

<210> 4818
<211> 8
<212> PRT
<213> Homo sapiens

<400> 4818

Ile Pro Asp Trp Phe Leu Asn Arg
1 5

<210> 4819
<211> 16
<212> PRT
<213> Homo sapiens

<400> 4819

Ile Arg Ala Ser Tyr Ala Gln Gln Pro Ala Glu Ser Arg Val Ser Gly
1 5 10 15

<210> 4820
<211> 13
<212> PRT
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<400> 4820

Ile Ser Trp Tyr Asp Asn Glu Phe Gly Tyr Ser Asn Arg
1 5 10

<210> 4821
<211> 18
<212> PRT
<213> Homo sapiens

<400> 4821

Ile Val Asn Thr Asn Val Pro Arg Ala Ser Val Pro Asp Gly Phe Leu
1 5 10 15

Ser Glu

<210> 4822
<211> 22
<212> PRT
<213> Homo sapiens

<400> 4822

Ile Val Asn Thr Asn Val Pro Arg Ala Ser Val Pro Asp Gly Phe Leu
1 5 10 15

Ser Glu Leu Thr Gln Gln
20

<210> 4823
<211> 18
<212> PRT
<213> Homo sapiens

<400> 4823

Ile Tyr Thr Arg Asn Thr Lys Gly Gly Asp Ala Pro Ala Ala Gly Glu
1 5 10 15

Asp Ala

<210> 4824
<211> 13
<212> PRT
<213> Homo sapiens

<400> 4824

Lys Ala Val Leu Thr Ile Asp Glu Lys Gly Thr Glu Ala
1 5 10

<210> 4825
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4825

Lys Ala Val Leu Thr Ile Asp Glu Lys Gly Thr Glu Ala Ala Gly
1 5 10 15

<210> 4826
<211> 14
<212> PRT
<213> Homo sapiens

<400> 4826

Lys Glu Tyr Phe Ala Ile Asp Asn Ser Gly Arg Ile Ile Thr
1 5 10

<210> 4827
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4827

Lys Phe Leu Ala Ser Val Ser Thr Val Leu Thr Ser Lys Tyr Arg
1 5 10 15

<210> 4828
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4828

Lys Pro Gly Gln Phe Ile Arg Ser Val Asp Pro Asp Ser Pro Ala
1 5 10 15

<210> 4829
<211> 26
<212> PRT
<213> Homo sapiens

<400> 4829

Lys Thr Asn Val Lys Ala Ala Trp Gly Lys Val Gly Ala His Ala Gly
1 5 10 15

Glu Tyr Gly Ala Glu Ala Leu Glu Arg Met
20 25

<210> 4830
<211> 21
<212> PRT
<213> Homo sapiens

<400> 4830

Leu Ala Gln Ala Thr Gly Lys Pro Pro Gln Tyr Ile Ala Val His Val
1 5 10 15

Val Pro Asp Gln Leu
            20

<210> 4831
<211> 14
<212> PRT
<213> Homo sapiens

<400> 4831

Leu Ile Ser Trp Tyr Asp Asn Glu Phe Gly Tyr Ser Asn Arg
1   5   10

<210> 4832
<211> 12
<212> PRT
<213> Homo sapiens

<400> 4832

Leu Ile Thr Pro Ala Val Val Ser Glu Arg Leu Lys
1   5   10

<210> 4833
<211> 13
<212> PRT
<213> Homo sapiens

<400> 4833

Leu Lys Lys Tyr Leu Tyr Glu Ile Ala Arg Arg His Pro
1   5   10

<210> 4834
<211> 19
<212> PRT
<213> Homo sapiens

<400> 4834

Leu Leu Thr Glu Ala Pro Leu Asn Pro Lys Ala Asn Arg Glu Lys Met
1   5   10   15

Thr Gln Ile

<210> 4835
<211> 10
<212> PRT
<213> Homo sapiens

<400> 4835

Leu Leu Val Val Tyr Pro Trp Thr Gln Arg
1   5   10

<210> 4836
<211> 11
<212> PRT
<213> Homo sapiens

<400> 4836

Leu Leu Val Val Tyr Pro Trp Thr Gln Arg Phe
1 5 10

<210> 4837
<211> 9
<212> PRT
<213> Homo sapiens

<400> 4837

Leu Arg Val Asp Pro Val Asn Phe Lys
1 5

<210> 4838
<211> 10
<212> PRT
<213> Homo sapiens

<400> 4838

Leu Ser Leu Gln Glu Pro Gly Ser Lys Thr
1 5 10

<210> 4839
<211> 22
<212> PRT
<213> Homo sapiens

<400> 4839

Leu Val Thr Leu Ala Ala His Leu Pro Ala Glu Phe Thr Pro Ala Val
1 5 10 15

His Ala Ser Leu Asp Lys
20

<210> 4840
<211> 16
<212> PRT
<213> Homo sapiens

<400> 4840

Asn Ile Phe Ser Phe Tyr Leu Ser Arg Asp Pro Asp Ala Gln Pro Gly
1 5 10 15

<210> 4841
<211> 21
<212> PRT
<213> Homo sapiens

<400> 4841

Pro Met Phe Ile Val Asn Thr Asn Val Pro Arg Ala Ser Val Pro Asp
1 5 10 15

Gly Phe Leu Ser Glu
20

<210> 4842
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4842

Gln Leu Gln Pro Asp Asn Ser Thr Leu Thr Trp Val Lys Pro Thr
1 5 10 15

<210> 4843
<211> 18
<212> PRT
<213> Homo sapiens

<400> 4843

Gln Val Asp Gln Phe Leu Gly Val Pro Tyr Ala Ala Pro Pro Leu Ala
1 5 10 15

Glu Arg

<210> 4844
<211> 18
<212> PRT
<213> Homo sapiens

<400> 4844

Gln Val Thr Gln Pro Thr Val Gly Met Asn Phe Lys Thr Pro Arg Gly
1 5 10 15

Pro Val

<210> 4845
<211> 13
<212> PRT
<213> Homo sapiens

<400> 4845

Arg Glu Ile Phe Asn Met Ala Arg Asp Gln Arg Ser Arg
1 5 10

<210> 4846
<211> 12
<212> PRT
<213> Homo sapiens

<400> 4846

Arg Phe Asp Ser Asp Val Gly Glu Phe Arg Ala Val
1 5 10

<210> 4847
<211> 14
<212> PRT
<213> Homo sapiens

<400> 4847

Arg Gly Asn Ser Ile Ile Met Leu Glu Ala Leu Glu Arg Val
1 5 10

<210> 4848
<211> 13
<212> PRT
<213> Homo sapiens

<400> 4848

Arg Leu Leu Leu Pro Gly Glu Leu Ala Lys His Ala Val
1 5 10

<210> 4849
<211> 18
<212> PRT
<213> Homo sapiens

<400> 4849

Arg Leu Leu Leu Pro Gly Glu Leu Ala Lys His Ala Val Ser Glu Gly
1 5 10 15

Thr Lys

<210> 4850
<211> 16
<212> PRT
<213> Homo sapiens

<400> 4850

Arg Leu Pro Ile Ile Asp Val Ala Pro Leu Asp Val Gly Ala Pro Asp
1 5 10 15

<210> 4851
<211> 16
<212> PRT
<213> Homo sapiens

<400> 4851

Arg Pro Lys Asp Tyr Glu Val Asp Ala Thr Leu Lys Ser Leu Asn Asn
1 5 10 15

<210> 4852
<211> 16
<212> PRT
<213> Homo sapiens

<400> 4852

Arg Val Met Thr Ile Ala Pro Gly Leu Phe Gly Thr Pro Leu Leu Thr
1 5 10 15

<210> 4853
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<212> PRT
<213> Homo sapiens

<400> 4853

Arg Tyr Ser Val Asp Ile Pro Leu Asp Lys Thr Val Val
1 5 10

<210> 4854
<211> 21
<212> PRT
<213> Homo sapiens

<400> 4854

Ser Glu Thr Ala Pro Ala Ala Pro Ala Ala Ala Pro Pro Ala Glu Lys
1 5 10 15

Ala Pro Val Lys Lys
20

<210> 4855
<211> 22
<212> PRT
<213> Homo sapiens

<400> 4855

Ser Glu Thr Ala Pro Ala Ala Pro Ala Ala Ala Pro Pro Ala Glu Lys
1 5 10 15

Ala Pro Val Lys Lys Lys
20

<210> 4856
<211> 33
<212> PRT
<213> Homo sapiens

<400> 4856

Ser Gly Asn Phe Gly Gly Ser Arg Asn Met Gly Gly Pro Tyr Gly Gly
1 5 10 15

Gly Asn Tyr Gly Pro Gly Gly Ser Gly Gly Ser Gly Gly Tyr Gly Gly
20 25 30

Arg

<210> 4857
<211> 14
<212> PRT
<213> Homo sapiens

<400> 4857

Ser Arg Ala Gly Leu Glu Leu Gly Ala Glu Pro Glu Thr Ile
1 5 10

<210> 4858
<211> 11
<212> PRT
<213> Homo sapiens

<400> 4858

Ser Arg Thr Ser Gly Leu Leu Ser Ser Trp Lys
1 5 10

<210> 4859
<211> 14
<212> PRT
<213> Homo sapiens

<400> 4859

Ser Val Pro Arg Tyr Leu Pro Arg Pro Ala Asn Pro Asp Glu
1 5 10

<210> 4860
<211> 16
<212> PRT
<213> Homo sapiens

<400> 4860

Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala
1 5 10 15

<210> 4861
<211> 14
<212> PRT
<213> Homo sapiens

<400> 4861

Ser Trp Tyr Asp Asn Glu Phe Gly Tyr Ser Asn Arg Val Val
1 5 10

<210> 4862
<211> 18
<212> PRT
<213> Homo sapiens

<400> 4862

Ser Tyr Glu Leu Pro Asp Gly Gln Val Ile Thr Ile Gly Asn Glu Arg
1 5 10 15

Phe Arg

<210> 4863
<211> 16
<212> PRT
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<400> 4863

Thr Gly Ala Ala Pro Ile Ile Asp Val Val Arg Ser Gly Tyr Tyr Lys
1 5 10 15

<210> 4864
<211> 23
<212> PRT
<213> Homo sapiens

<400> 4864

Thr Gly Gly Ala Ser Gly Leu Gly Leu Ala Thr Ala Glu Arg Leu Val
1 5 10 15

Gly Gln Gly Ala Ser Ala Val
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<210> 4865
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<212> PRT
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<400> 4865

Thr Gly Lys Asn Lys Trp Phe Phe Gln Lys Leu Arg Phe
1 5 10

<210> 4866
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<212> PRT
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<400> 4866

Thr Asn Val Pro Pro Glu Val Thr Val Leu Thr Asn Ser Pro Val
1 5 10 15

<210> 4867
<211> 14
<212> PRT
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<400> 4867

Thr Gln Gly Lys Ile Val Asp Leu Val Lys Glu Leu Asp Arg
1 5 10

<210> 4868
<211> 16
<212> PRT
<213> Homo sapiens

<400> 4868

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

<210> 4869
<211> 11
<212> PRT
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<400> 4869

Thr Val Asp Gly Pro Ser Gly Lys Leu Trp Arg
1 5 10

<210> 4870
<211> 17
<212> PRT
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<400> 4870

Thr Trp Leu Arg Asn Gly Lys Pro Val Thr Thr Gly Val Ser Glu Thr
1 5 10 15

Val

<210> 4871
<211> 16
<212> PRT
<213> Homo sapiens

<400> 4871

Thr Tyr Phe Pro His Phe Asp Leu Ser His Gly Ser Ala Gln Val Lys

1 5 10 15

<210> 4872
<211> 21
<212> PRT
<213> Homo sapiens

<400> 4872

Thr Tyr Phe Pro His Phe Asp Leu Ser His Gly Ser Ala Gln Val Lys
1 5 10 15

Gly His Gly Lys Lys
20

<210> 4873
<211> 29
<212> PRT
<213> Homo sapiens

<400> 4873

Val Ala Asp Ala Leu Thr Asn Ala Val Ala His Val Asp Asp Met Pro
1 5 10 15

Asn Ala Leu Ser Ala Leu Ser Asp Leu His Ala His Lys
20 25

<210> 4874
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4874

Val Gly Ala His Ala Gly Glu Tyr Gly Ala Glu Ala Leu Glu Arg
1 5 10 15

<210> 4875
<211> 24
<212> PRT
<213> Homo sapiens

<400> 4875

Val Gly Ala His Ala Gly Glu Tyr Gly Ala Glu Ala Leu Glu Arg Met
1 5 10 15

Phe Leu Ser Phe Pro Thr Thr Lys
20

<210> 4876
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<212> PRT
<213> Homo sapiens

<400> 4876

Val His Lys Ala Val Leu Thr Ile Asp Glu Lys Gly Thr Glu Ala Ala
1 5 10 15

Gly

<210> 4877
<211> 8
<212> PRT
<213> Homo sapiens

<400> 4877

Val His Leu Thr Pro Glu Glu Lys
1 5

<210> 4878
<211> 32
<212> PRT
<213> Homo sapiens

<400> 4878

Val His Leu Thr Pro Glu Glu Lys Ser Ala Val Thr Ala Leu Trp Gly
1 5 10 15

Lys Val Asn Val Asp Glu Val Gly Gly Glu Ala Leu Gly Arg Leu Leu
20 25 30

<210> 4879
<211> 16
<212> PRT
<213> Homo sapiens

<400> 4879

Val Leu Ser Pro Ala Asp Lys Thr Asn Val Lys Ala Ala Trp Gly Lys
1 5 10 15

<210> 4880
<211> 32
<212> PRT
<213> Homo sapiens

<400> 4880

Val Leu Ser Pro Ala Asp Lys Thr Asn Val Lys Ala Ala Trp Gly Lys
1 5 10 15

Val Gly Ala His Ala Gly Glu Tyr Gly Ala Glu Ala Leu Glu Arg Met
20 25 30

<210> 4881
<211> 33
<212> PRT
<213> Homo sapiens

<400> 4881

Val Leu Ser Pro Ala Asp Lys Thr Asn Val Lys Ala Ala Trp Gly Lys
1 5 10 15

Val Gly Ala His Ala Gly Glu Tyr Gly Ala Glu Ala Leu Glu Arg Met
20 25 30

Phe

<210> 4882
<211> 12
<212> PRT
<213> Homo sapiens

<400> 4882

Val Val Asp Leu Met Ala His Met Ala Ser Lys Glu
1 5 10

<210> 4883
<211> 11
<212> PRT
<213> Homo sapiens

<400> 4883

Val Trp Arg Leu Glu Glu Phe Gly Arg Phe Ala
1 5 10

<210> 4884
<211> 16
<212> PRT
<213> Homo sapiens

<400> 4884

Trp Leu Arg Asn Gly Lys Pro Val Thr Thr Gly Val Ser Glu Thr Val
1 5 10 15

<210> 4885
<211> 10
<212> PRT
<213> Homo sapiens

<400> 4885

Trp Arg Leu Glu Glu Phe Gly Arg Phe Ala
1 5 10

<210> 4886
<211> 14
<212> PRT
<213> Homo sapiens

<400> 4886

Tyr Asp His Asn Phe Val Lys Ala Ile Asn Ala Ile Gln Lys
1 5 10

<210> 4887
<211> 16
<212> PRT
<213> Homo sapiens

<400> 4887

Tyr Gly Gly Glu Leu Arg Phe Thr Val Thr Gln Arg Ser Gln Pro Gly
1 5 10 15

<210> 4888
<211> 16
<212> PRT
<213> Homo sapiens

<400> 4888

Tyr Pro Lys Ser Leu His Met Tyr Ala Asn Arg Leu Leu Asp His Arg
1 5 10 15

<210> 4889
<211> 12
<212> PRT
<213> Homo sapiens

<400> 4889

Tyr Tyr Lys Val Asp Glu Asn Gly Lys Ile Ser Arg
1 5 10

<210> 4890
<211> 23
<212> PRT
<213> Homo sapiens

<400> 4890

Ala Val Thr Glu Leu Gly Arg Pro Asp Ala Glu Tyr Trp Asn Ser Gln
1 5 10 15

Lys Asp Ile Leu Glu Gln Lys
20

<210> 4891
<211> 18
<212> PRT
<213> Homo sapiens

<400> 4891

Cys Pro Thr Pro Cys Gln Leu Gln Ala Glu Gln Ala Phe Leu Arg Thr
1 5 10 15

Val Gln

<210> 4892
<211> 17
<212> PRT
<213> Homo sapiens

<400> 4892

Phe Ile Val Asn Thr Asn Val Pro Arg Ala Ser Val Pro Asp Gly Phe
1 5 10 15

Leu

<210> 4893
<211> 11
<212> PRT
<213> Homo sapiens

<400> 4893

Leu Leu Ile Pro Thr Ser Phe Ser Pro Leu Lys
1 5 10

<210> 4894
<211> 20
<212> PRT
<213> Homo sapiens

<400> 4894

Pro Ala Ala Pro Ala Ala Pro Ala Pro Ala Glu Lys Thr Pro Val Lys
1 5 10 15

Lys Lys Ala Arg
20

<210> 4895
<211> 764
<212> PRT
<213> Homo sapiens

<400> 4895

Met Arg Pro Ala Asp Leu Leu Gln Leu Val Leu Leu Leu Asp Leu Pro
1 5 10 15

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Arg Asp Leu Gly Gly Met Gly Cys Ser Ser Pro Pro Cys Glu Cys His
            20                  25                  30

Gln Glu Glu Asp Phe Arg Val Thr Cys Lys Asp Ile Gln Arg Ile Pro
        35                  40                  45

Ser Leu Pro Pro Ser Thr Gln Thr Leu Lys Leu Ile Glu Thr His Leu
    50                  55                  60

Arg Thr Ile Pro Ser His Ala Phe Ser Asn Leu Pro Asn Ile Ser Arg
65                  70                  75                  80

Ile Tyr Val Ser Ile Asp Val Thr Leu Gln Gln Leu Glu Ser His Ser
                85                  90                  95

Phe Tyr Asn Leu Ser Lys Val Thr His Ile Glu Ile Arg Asn Thr Arg
            100                 105                 110

Asn Leu Thr Tyr Ile Asp Pro Asp Ala Leu Lys Glu Leu Pro Leu Leu
        115                 120                 125

Lys Phe Leu Gly Ile Phe Asn Thr Gly Leu Lys Met Phe Pro Asp Leu
    130                 135                 140

Thr Lys Val Tyr Ser Thr Asp Ile Phe Phe Ile Leu Glu Ile Thr Asp
145                 150                 155                 160

Asn Pro Tyr Met Thr Ser Ile Pro Val Asn Ala Phe Gln Gly Leu Cys
                165                 170                 175

Asn Glu Thr Leu Thr Leu Lys Leu Tyr Asn Asn Gly Phe Thr Ser Val
            180                 185                 190

Gln Gly Tyr Ala Phe Asn Gly Thr Lys Leu Asp Ala Val Tyr Leu Asn
        195                 200                 205

Lys Asn Lys Tyr Leu Thr Val Ile Asp Lys Asp Ala Phe Gly Gly Val
    210                 215                 220

Tyr Ser Gly Pro Ser Leu Leu Asp Val Ser Gln Thr Ser Val Thr Ala
225                 230                 235                 240

Leu Pro Ser Lys Gly Leu Glu His Leu Lys Glu Leu Ile Ala Arg Asn
                245                 250                 255

Thr Trp Thr Leu Lys Lys Leu Pro Leu Ser Leu Ser Phe Leu His Leu
            260                 265                 270
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Thr Arg Ala Asp Leu Ser Tyr Pro Ser His Cys Cys Ala Phe Lys Asn
        275                 280                 285

Gln Lys Lys Ile Arg Gly Ile Leu Glu Ser Leu Met Cys Asn Glu Ser
    290                 295                 300

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

Pro Leu His Gln Glu Tyr Glu Glu Asn Leu Gly Asp Ser Ile Val Gly
                325                 330                 335

Tyr Lys Glu Lys Ser Lys Phe Gln Asp Thr His Asn Asn Ala His Tyr
            340                 345                 350

Tyr Val Phe Phe Glu Glu Gln Glu Asp Glu Ile Ile Gly Phe Gly Gln
        355                 360                 365

Glu Leu Lys Asn Pro Gln Glu Glu Thr Leu Gln Ala Phe Asp Ser His
    370                 375                 380

Tyr Asp Tyr Thr Ile Cys Gly Asp Ser Glu Asp Met Val Cys Thr Pro
385                 390                 395                 400

Lys Ser Asp Glu Phe Asn Pro Cys Glu Asp Ile Met Gly Tyr Lys Phe
                405                 410                 415

Leu Arg Ile Val Val Trp Phe Val Ser Leu Leu Ala Leu Leu Gly Asn
            420                 425                 430

Val Phe Val Leu Leu Ile Leu Leu Thr Ser His Tyr Lys Leu Asn Val
        435                 440                 445

Pro Arg Phe Leu Met Cys Asn Leu Ala Phe Ala Asp Phe Cys Met Gly
    450                 455                 460

Met Tyr Leu Leu Leu Ile Ala Ser Val Asp Leu Tyr Thr His Ser Glu
465                 470                 475                 480

Tyr Tyr Asn His Ala Ile Asp Trp Gln Thr Gly Pro Gly Cys Asn Thr
                485                 490                 495

Ala Gly Phe Phe Thr Val Phe Ala Ser Glu Leu Ser Val Tyr Thr Leu
            500                 505                 510

Thr Val Ile Thr Leu Glu Arg Trp Tyr Ala Ile Thr Phe Ala Met Arg
        515                 520                 525
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Leu Asp Arg Lys Ile Arg Leu Arg His Ala Cys Ala Ile Met Val Gly
    530                 535                 540

Gly Trp Val Cys Cys Phe Leu Leu Ala Leu Leu Pro Leu Val Gly Ile
545                 550                 555                 560

Ser Ser Tyr Ala Lys Val Ser Ile Cys Leu Pro Met Asp Thr Glu Thr
                565                 570                 575

Pro Leu Ala Leu Ala Tyr Ile Val Phe Val Leu Thr Leu Asn Ile Val
            580                 585                 590

Ala Phe Val Ile Val Cys Cys Cys Tyr Val Lys Ile Tyr Ile Thr Val
        595                 600                 605

Arg Asn Pro Gln Tyr Asn Pro Gly Asp Lys Asp Thr Lys Ile Ala Lys
    610                 615                 620

Arg Met Ala Val Leu Ile Phe Thr Asp Phe Ile Cys Met Ala Pro Ile
625                 630                 635                 640

Ser Phe Tyr Ala Leu Ser Ala Ile Leu Asn Lys Pro Leu Ile Thr Val
                645                 650                 655

Ser Asn Ser Lys Ile Leu Leu Val Leu Phe Tyr Pro Leu Asn Ser Cys
            660                 665                 670

Ala Asn Pro Phe Leu Tyr Ala Ile Phe Thr Lys Ala Phe Gln Arg Asp
        675                 680                 685

Val Phe Ile Leu Leu Ser Lys Phe Gly Ile Cys Lys Arg Gln Ala Gln
    690                 695                 700

Ala Tyr Arg Gly Gln Arg Val Pro Pro Lys Asn Ser Thr Asp Ile Gln
705                 710                 715                 720

Val Gln Lys Val Thr His Asp Met Arg Gln Gly Leu His Asn Met Glu
                725                 730                 735

Asp Val Tyr Glu Leu Ile Glu Asn Ser His Leu Thr Pro Lys Lys Gln
            740                 745                 750

Gly Gln Ile Ser Glu Glu Tyr Met Gln Thr Val Leu
        755                 760
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<210> 4896

<211> 9
<212> PRT
<213> Homo sapiens

<400> 4896

Ala Leu Ala Val Leu Ser Val Thr Leu
1 5

<210> 4897
<211> 9
<212> PRT
<213> Homo sapiens

<400> 4897

Ala Leu Ser Glu Asp Leu Leu Ser Ile
1 5

<210> 4898
<211> 9
<212> PRT
<213> Homo sapiens

<400> 4898

Gly Leu Leu Asp Gln Val Ala Ala Leu
1 5

<210> 4899
<211> 9
<212> PRT
<213> Homo sapiens

<400> 4899

Gly Leu Arg Glu Asp Leu Leu Ser Leu
1 5

<210> 4900
<211> 9
<212> PRT
<213> Homo sapiens

<400> 4900

Leu Leu Ile Gly Gly Phe Ala Gly Leu
1 5

<210> 4901
<211> 10
<212> PRT
<213> Homo sapiens

<400> 4901

Ser Leu Gln Asp Val Pro Leu Ala Ala Leu
1 5 10

<210> 4902
<211> 9
<212> PRT
<213> Streptococcus pyogenes

<400> 4902

Ala Leu Glu Lys Leu Asn Lys Glu Leu
1 5

<210> 4903
<211> 9
<212> PRT
<213> Homo sapiens

<400> 4903

Glu Phe Gln Lys Met Arg Arg Asp Leu
1 5

<210> 4904
<211> 9
<212> PRT
<213> Streptococcus pyogenes

<400> 4904

Lys Leu Asn Lys Glu Leu Glu Glu Ser
1 5

<210> 4905
<211> 9
<212> PRT
<213> Homo sapiens

<400> 4905

Lys Met Arg Arg Asp Leu Glu Glu Ala
1 5

<210> 4906
<211> 43
<212> PRT
<213> Homo sapiens

<400> 4906

Ala Glu Arg Ala Ala Leu Glu Glu Leu Val Lys Leu Gln Gly Glu Arg
1 5 10 15

Val Arg Gly Leu Lys Gln Gln Lys Ala Ser Ala Glu Leu Ile Glu Glu
20 25 30

Glu Val Ala Lys Leu Leu Lys Leu Lys Ala Gln
35 40

<210> 4907
<211> 25
<212> PRT
<213> Homo sapiens

<400> 4907

Val Ala Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg Gly Arg
1 5 10 15

Gly Arg Gly Arg Gly Gly Pro Arg Arg
20 25

<210> 4908
<211> 10
<212> PRT
<213> Homo sapiens

<400> 4908

Gly Ser Ala Ser Pro Met Glu Leu Leu Ser
1 5 10

<210> 4909
<211> 10
<212> PRT
<213> Homo sapiens

<400> 4909

Ile Phe Met Ser Asn Ser Tyr Pro Arg Asp
1 5 10

<210> 4910
<211> 12
<212> PRT
<213> Homo sapiens

<400> 4910

Arg Leu Asp Asn Arg Tyr Gln Pro Met Glu Pro Asn
1 5 10

<210> 4911
<211> 10
<212> PRT
<213> Homo sapiens

<400> 4911

Ser Ala Arg Ile Pro Cys Phe Leu Ala Gly
1 5 10

<210> 4912
<211> 10

<212> PRT
<213> Homo sapiens

<400> 4912

Trp Asp Gly Glu Arg Leu Tyr Gln Glu Ala
1   5   10

<210> 4913
<211> 10
<212> PRT
<213> Homo sapiens

<400> 4913

Trp Thr Pro Gly Val Lys Arg Asn Gly Phe
1   5   10

<210> 4914
<211> 10
<212> PRT
<213> Homo sapiens

<400> 4914

Tyr Arg Ser Tyr Asn Asp Ser Val Asp Pro
1   5   10

<210> 4915
<211> 7
<212> PRT
<213> Helicobacter pylori

<400> 4915

Ala Lys Glu Glu Arg Arg Tyr
1   5

<210> 4916
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in autoimmune pancreatitis

<400> 4916

Arg Phe Glu Gln Pro Arg Val
1   5

<210> 4917
<211> 7
<212> PRT
<213> Unknown

<220>
<223> epitope involved in autoimmune pancreatitis

<400> 4917

Ser Lys Asp Glu Arg Arg Phe
1 5

<210> 4918
<211> 15
<212> PRT
<213> Mycobacterium avium

<400> 4918

Thr Cys Arg Arg Met Leu Ala Phe Leu Lys Asp Lys Glu Asn Arg
1 5 10 15

<210> 4919
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4919

Gly Glu Ala Leu Ser Thr Leu Val Leu Asn Arg Leu Lys Val Gly
1 5 10 15

<210> 4920
<211> 15
<212> PRT
<213> Mycobacterium sp.

<400> 4920

Gly Glu Ala Leu Ser Thr Leu Val Val Asn Lys Ile Arg Gly Thr
1 5 10 15

<210> 4921
<211> 15
<212> PRT
<213> Mycobacterium sp.

<400> 4921

Ile Ala Gly Leu Phe Leu Thr Thr Glu Ala Val Val Ala Asp Lys
1 5 10 15

<210> 4922
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4922

Val Ala Ser Leu Leu Thr Thr Ala Glu Val Val Val Thr Glu Ile
1 5 10 15

<210> 4923

<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in Crohn's disease

<400> 4923

Gly Gly Ile Tyr Gln Asp Leu Val Ser
1 5

<210> 4924
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in Crohn's disease

<400> 4924

Gly Leu Leu Ala Gln Gln Met Asp Tyr
1 5

<210> 4925
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in Crohn's disease

<400> 4925

Arg Leu Val Gly Gln Gln Val Met Gln
1 5

<210> 4926
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in Crohn's disease

<400> 4926

Arg Gln Ser Asp Gly Gln Tyr Gln Met
1 5

<210> 4927
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in Crohn's disease

<400> 4927

Tyr Arg Trp Leu Pro Pro Ser Ser Ala
1 5

<210> 4928
<211> 15
<212> PRT
<213> Mycobacterium avium

<400> 4928

Ala Gly Asp Leu Ser Lys Val Asp Ala Lys Gln Pro Gly Asp Tyr
1 5 10 15

<210> 4929
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4929

Cys Gln Ala Leu Val Arg Met Leu Ala Lys Lys Pro Gly Trp Lys
1 5 10 15

<210> 4930
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4930

Asp Phe Thr Tyr Asp Gln Val Ala Phe Asn Gly Leu Pro Gln Phe
1 5 10 15

<210> 4931
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4931

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

<210> 4932
<211> 15
<212> PRT
<213> Mycobacterium avium

<400> 4932

Glu Arg Pro Leu Lys Gln Ile Ala Phe Asn Gly Gly Leu Glu Pro
1 5 10 15

<210> 4933
<211> 15

<212> PRT
<213> Homo sapiens

<400> 4933

Gly Arg Gly Asn Gly Asp Pro Gly Gly Gly Met Glu Lys Asp Gly
1 5 10 15

<210> 4934
<211> 15
<212> PRT
<213> Mycobacterium avium

<400> 4934

Leu Ala Lys Leu Ala Gly Gly Val Ala Val Ile Cys Ala Gly Ala
1 5 10 15

<210> 4935
<211> 15
<212> PRT
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<400> 4935

Leu Ala Lys Leu Gly Gly Ala Gly Gln Ala Ala Arg Ala Gly Thr
1 5 10 15

<210> 4936
<211> 14
<212> PRT
<213> Homo sapiens

<400> 4936

Asn Glu His Pro Val Phe Ala Tyr Leu Lys Asp Lys Leu Pro
1 5 10

<210> 4937
<211> 15
<212> PRT
<213> Mycobacterium avium

<400> 4937

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

<210> 4938
<211> 11
<212> PRT
<213> Unknown

<220>
<223> epitope involved in Crohn's disease

<400> 4938

Cys Asn Leu Trp Glu Val Met His Gly Thr Cys
1 5 10

<210> 4939
<211> 11
<212> PRT
<213> Unknown

<220>
<223> epitope involved in Crohn's disease

<400> 4939

Cys Ser Ile Gly Glu Ala Leu Ser His Gly Cys
1 5 10

<210> 4940
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in Crohn's disease

<400> 4940

Pro Trp Ala Thr Leu Val Ala Glu Ser
1 5

<210> 4941
<211> 9
<212> PRT
<213> Unknown

<220>
<223> epitope involved in Crohn's disease

<400> 4941

Thr Met Trp Asp Ala Leu Glu Ala Pro
1 5

<210> 4942
<211> 15
<212> PRT
<213> Mycobacterium avium

<400> 4942

Thr Cys Arg Arg Met Leu Ala Phe Leu Lys Asp Lys Glu Asn Arg
1 5 10 15

<210> 4943
<211> 5
<212> PRT
<213> Homo sapiens

<400> 4943

Pro Lys Lys Ala Lys
1 5

<210> 4944
<211> 15
<212> PRT
<213> Mycobacterium avium

<400> 4944

Ala Gly Asp Leu Ser Lys Val Asp Ala Lys Gln Pro Gly Asp Tyr
1 5 10 15

<210> 4945
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4945

Cys Gln Ala Leu Val Arg Met Leu Ala Lys Lys Pro Gly Trp Lys
1 5 10 15

<210> 4946
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4946

Asp Phe Thr Tyr Asp Gln Val Ala Phe Asn Gly Leu Pro Gln Phe
1 5 10 15

<210> 4947
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4947

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

<210> 4948
<211> 15
<212> PRT
<213> Mycobacterium avium

<400> 4948

Glu Arg Pro Leu Lys Gln Ile Ala Phe Asn Gly Gly Leu Glu Pro
1 5 10 15

<210> 4949
<211> 15
<212> PRT

<213> Homo sapiens

<400> 4949

Gly Arg Gly Asn Gly Asp Pro Gly Gly Gly Met Glu Lys Asp Gly
1 5 10 15

<210> 4950
<211> 14
<212> PRT
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<400> 4950

Asn Glu His Pro Val Phe Ala Tyr Leu Lys Asp Lys Leu Pro
1 5 10

<210> 4951
<211> 15
<212> PRT
<213> Mycobacterium avium

<400> 4951

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

<210> 4952
<211> 9
<212> PRT
<213> Homo sapiens

<400> 4952

Ala His Trp Ser Gly His Cys Cys Leu
1 5

<210> 4953
<211> 15
<212> PRT
<213> Mycobacterium avium

<400> 4953

Thr Cys Arg Arg Met Leu Ala Phe Leu Lys Asp Lys Glu Asn Arg
1 5 10 15

<210> 4954
<211> 5
<212> PRT
<213> Homo sapiens

<400> 4954

Pro Lys Lys Ala Lys
1 5

<210> 4955
<211> 15
<212> PRT
<213> Mycobacterium avium

<400> 4955

Ala Gly Asp Leu Ser Lys Val Asp Ala Lys Gln Pro Gly Asp Tyr
1 5 10 15

<210> 4956
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4956

Cys Gln Ala Leu Val Arg Met Leu Ala Lys Lys Pro Gly Trp Lys
1 5 10 15

<210> 4957
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4957

Asp Phe Thr Tyr Asp Gln Val Ala Phe Asn Gly Leu Pro Gln Phe
1 5 10 15

<210> 4958
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4958

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

<210> 4959
<211> 15
<212> PRT
<213> Mycobacterium avium

<400> 4959

Glu Arg Pro Leu Lys Gln Ile Ala Phe Asn Gly Gly Leu Glu Pro
1 5 10 15

<210> 4960
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4960

Gly Arg Gly Asn Gly Asp Pro Gly Gly Gly Met Glu Lys Asp Gly

1 5 10 15

<210> 4961
<211> 14
<212> PRT
<213> Homo sapiens

<400> 4961

Asn Glu His Pro Val Phe Ala Tyr Leu Lys Asp Lys Leu Pro
1 5 10

<210> 4962
<211> 15
<212> PRT
<213> Mycobacterium avium

<400> 4962

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

<210> 4963
<211> 9
<212> PRT
<213> Homo sapiens

<400> 4963

Ala His Trp Ser Gly His Cys Cys Leu
1 5

<210> 4964
<211> 15
<212> PRT
<213> Mycobacterium avium

<400> 4964

Thr Cys Arg Arg Met Leu Ala Phe Leu Lys Asp Lys Glu Asn Arg
1 5 10 15

<210> 4965
<211> 5
<212> PRT
<213> Homo sapiens

<400> 4965

Pro Lys Lys Ala Lys
1 5

<210> 4966
<211> 15
<212> PRT
<213> Mycobacterium avium

<400> 4966

Ala Gly Asp Leu Ser Lys Val Asp Ala Lys Gln Pro Gly Asp Tyr
1 5 10 15

<210> 4967
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4967

Cys Gln Ala Leu Val Arg Met Leu Ala Lys Lys Pro Gly Trp Lys
1 5 10 15

<210> 4968
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4968

Asp Phe Thr Tyr Asp Gln Val Ala Phe Asn Gly Leu Pro Gln Phe
1 5 10 15

<210> 4969
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4969

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

<210> 4970
<211> 15
<212> PRT
<213> Mycobacterium avium

<400> 4970

Glu Arg Pro Leu Lys Gln Ile Ala Phe Asn Gly Gly Leu Glu Pro
1 5 10 15

<210> 4971
<211> 15
<212> PRT
<213> Homo sapiens

<400> 4971

Gly Arg Gly Asn Gly Asp Pro Gly Gly Gly Met Glu Lys Asp Gly
1 5 10 15

<210> 4972
<211> 14

<212> PRT
<213> Homo sapiens

<400> 4972

Asn Glu His Pro Val Phe Ala Tyr Leu Lys Asp Lys Leu Pro
1 5 10

<210> 4973
<211> 15
<212> PRT
<213> Mycobacterium avium

<400> 4973

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

<210> 4974
<211> 9
<212> PRT
<213> Homo sapiens

<400> 4974

Ala His Trp Ser Gly His Cys Cys Leu
1 5

<210> 4975
<211> 304
<212> PRT
<213> Homo sapiens

<400> 4975

Met Gly Asn His Ala Gly Lys Arg Glu Leu Asn Ala Glu Lys Ala Ser
1 5 10 15

Thr Asn Ser Glu Thr Asn Arg Gly Glu Ser Glu Lys Lys Arg Asn Leu
20 25 30

Gly Glu Leu Ser Arg Thr Thr Ser Glu Asp Asn Glu Val Phe Gly Glu
35 40 45

Ala Asp Ala Asn Gln Asn Asn Gly Thr Ser Ser Gln Asp Thr Ala Val
50 55 60

Thr Asp Ser Lys Arg Thr Ala Asp Pro Lys Asn Ala Trp Gln Asp Ala
65 70 75 80

His Pro Ala Asp Pro Gly Ser Arg Pro His Leu Ile Arg Leu Phe Ser
85 90 95

Arg Asp Ala Pro Gly Arg Glu Asp Asn Thr Phe Lys Asp Arg Pro Ser

100 105 110

Glu Ser Asp Glu Leu Gln Thr Ile Gln Glu Asp Ser Ala Ala Thr Ser
115 120 125

Glu Ser Leu Asp Val Met Ala Ser Gln Lys Arg Pro Ser Gln Arg His
130 135 140

Gly Ser Lys Tyr Leu Ala Thr Ala Ser Thr Met Asp His Ala Arg His
145 150 155 160

Gly Phe Leu Pro Arg His Arg Asp Thr Gly Ile Leu Asp Ser Ile Gly
165 170 175

Arg Phe Phe Gly Gly Asp Arg Gly Ala Pro Lys Arg Gly Ser Gly Lys
180 185 190

Asp Ser His His Pro Ala Arg Thr Ala His Tyr Gly Ser Leu Pro Gln
195 200 205

Lys Ser His Gly Arg Thr Gln Asp Glu Asn Pro Val Val His Phe Phe
210 215 220

Lys Asn Ile Val Thr Pro Arg Thr Pro Pro Pro Ser Gln Gly Lys Gly
225 230 235 240

Arg Gly Leu Ser Leu Ser Arg Phe Ser Trp Gly Ala Glu Gly Gln Arg
245 250 255

Pro Gly Phe Gly Tyr Gly Gly Arg Ala Ser Asp Tyr Lys Ser Ala His
260 265 270

Lys Gly Phe Lys Gly Val Asp Ala Gln Gly Thr Leu Ser Lys Ile Phe
275 280 285

Lys Leu Gly Gly Arg Asp Ser Arg Ser Gly Ser Pro Met Ala Arg Arg
290 295 300

<210> 4976
<211> 203
<212> PRT
<213> Homo sapiens

<400> 4976

Met Ala Ser Gln Lys Arg Pro Ser Gln Arg His Gly Ser Lys Tyr Leu
1 5 10 15

Ala Thr Ala Ser Thr Met Asp His Ala Arg His Gly Phe Leu Pro Arg

20 25 30

His Arg Asp Thr Gly Ile Leu Asp Ser Ile Gly Arg Phe Phe Gly Gly
35 40 45

Asp Arg Gly Ala Pro Lys Arg Gly Ser Gly Lys Val Pro Trp Leu Lys
50 55 60

Pro Gly Arg Ser Pro Leu Pro Ser His Ala Arg Ser Gln Pro Gly Leu
65 70 75 80

Cys Asn Met Tyr Lys Asp Ser His His Pro Ala Arg Thr Ala His Tyr
85 90 95

Gly Ser Leu Pro Gln Lys Ser His Gly Arg Thr Gln Asp Glu Asn Pro
100 105 110

Val Val His Phe Phe Lys Asn Ile Val Thr Pro Arg Thr Pro Pro Pro
115 120 125

Ser Gln Gly Lys Gly Arg Gly Leu Ser Leu Ser Arg Phe Ser Trp Gly
130 135 140

Ala Glu Gly Gln Arg Pro Gly Phe Gly Tyr Gly Gly Arg Ala Ser Asp
145 150 155 160

Tyr Lys Ser Ala His Lys Gly Phe Lys Gly Val Asp Ala Gln Gly Thr
165 170 175

Leu Ser Lys Ile Phe Lys Leu Gly Gly Arg Asp Ser Arg Ser Gly Ser
180 185 190

Pro Met Ala Arg Arg His His His His His His
195 200

<210> 4977
<211> 277
<212> PRT
<213> Homo sapiens

<400> 4977

Met Gly Leu Leu Glu Cys Cys Ala Arg Cys Leu Val Gly Ala Pro Phe
1 5 10 15

Ala Ser Leu Val Ala Thr Gly Leu Cys Phe Phe Gly Val Ala Leu Phe
20 25 30

Cys Gly Cys Gly His Glu Ala Leu Thr Gly Thr Glu Lys Leu Ile Glu

35 40 45

Thr Tyr Phe Ser Lys Asn Tyr Gln Asp Tyr Glu Tyr Leu Ile Asn Val
50 55 60

Ile His Ala Phe Gln Tyr Val Ile Tyr Gly Thr Ala Ser Phe Phe Phe
65 70 75 80

Leu Tyr Gly Ala Leu Leu Leu Ala Glu Gly Phe Tyr Thr Thr Gly Ala
85 90 95

Val Arg Gln Ile Phe Gly Asp Tyr Lys Thr Thr Ile Cys Gly Lys Gly
100 105 110

Leu Ser Ala Thr Val Thr Gly Gly Gln Lys Gly Arg Gly Ser Arg Gly
115 120 125

Gln His Gln Ala His Ser Leu Glu Arg Val Cys His Cys Leu Gly Lys
130 135 140

Trp Leu Gly His Pro Asp Lys Phe Val Gly Ile Thr Tyr Ala Leu Thr
145 150 155 160

Val Val Trp Leu Leu Val Phe Ala Cys Ser Ala Val Pro Val Tyr Ile
165 170 175

Tyr Phe Asn Thr Trp Thr Thr Cys Gln Ser Ile Ala Phe Pro Ser Lys
180 185 190

Thr Ser Ala Ser Ile Gly Ser Leu Cys Ala Asp Ala Arg Met Tyr Gly
195 200 205

Val Leu Pro Trp Asn Ala Phe Pro Gly Lys Val Cys Gly Ser Asn Leu
210 215 220

Leu Ser Ile Cys Lys Thr Ala Glu Phe Gln Met Thr Phe His Leu Phe
225 230 235 240

Ile Ala Ala Phe Val Gly Ala Ala Ala Thr Leu Val Ser Leu Leu Thr
245 250 255

Phe Met Ile Ala Ala Thr Tyr Asn Phe Ala Val Leu Lys Leu Met Gly
260 265 270

Arg Gly Thr Lys Phe
275

<210> 4978
<211> 295
<212> PRT
<213> Homo sapiens

<400> 4978

```
Met Ala Ser Leu Ser Arg Pro Ser Leu Pro Ser Cys Leu Cys Ser Phe
1               5                  10                  15

Leu Leu Leu Leu Leu Leu Gln Val Ser Ser Ser Tyr Ala Gly Gln Phe
            20                  25                  30

Arg Val Ile Gly Pro Arg His Pro Ile Arg Ala Leu Val Gly Asp Glu
        35                  40                  45

Val Glu Leu Pro Cys Arg Ile Ser Pro Gly Lys Asn Ala Thr Gly Met
    50                  55                  60

Glu Val Gly Trp Tyr Arg Pro Pro Phe Ser Arg Val Val His Leu Tyr
65                  70                  75                  80

Arg Asn Gly Lys Asp Gln Asp Gly Asp Gln Ala Pro Glu Tyr Arg Gly
                85                  90                  95

Arg Thr Glu Leu Leu Lys Asp Ala Ile Gly Glu Gly Lys Val Thr Leu
            100                 105                 110

Arg Ile Arg Asn Val Arg Phe Ser Asp Glu Gly Gly Phe Thr Cys Phe
        115                 120                 125

Phe Arg Asp His Ser Tyr Gln Glu Glu Ala Ala Met Glu Leu Lys Val
    130                 135                 140

Glu Asp Pro Phe Tyr Trp Val Ser Pro Gly Val Leu Val Leu Leu Ala
145                 150                 155                 160

Val Leu Pro Val Leu Leu Leu Gln Ile Thr Val Gly Leu Val Phe Leu
                165                 170                 175

Cys Leu Gln Tyr Arg Leu Arg Gly Lys Leu Arg Ala Glu Ile Glu Asn
            180                 185                 190

Leu His Arg Thr Phe Asp Pro His Phe Leu Arg Val Pro Cys Trp Lys
        195                 200                 205

Ile Thr Leu Phe Val Ile Val Pro Val Leu Gly Pro Leu Val Ala Leu
    210                 215                 220
```

Ile Ile Cys Tyr Asn Trp Leu His Arg Arg Leu Ala Gly Gln Phe Leu
225 230 235 240

Glu Glu Leu Arg Lys Phe Ser Ser Leu Cys Tyr Lys Gln Arg Ile Lys
245 250 255

Ser Gln Glu Arg Glu Thr Glu Ala Thr Arg Gly Arg Gly Gly Leu Leu
260 265 270

Arg Asp His Ile Pro Arg Gly Lys Glu Glu Leu Glu Ser Leu Gly Gly
275 280 285

Gly Lys Thr Pro Pro Gly Arg
290 295

<210> 4979
<211> 323
<212> PRT
<213> Homo sapiens

<400> 4979

Met Ser Asp Arg Pro Thr Ala Arg Arg Trp Gly Lys Cys Gly Pro Leu
1 5 10 15

Cys Thr Arg Glu Asn Ile Met Val Ala Phe Lys Gly Val Trp Thr Gln
20 25 30

Ala Phe Trp Lys Ala Val Thr Ala Glu Phe Leu Ala Met Leu Ile Phe
35 40 45

Val Leu Leu Ser Leu Gly Ser Thr Ile Asn Trp Gly Gly Thr Glu Lys
50 55 60

Pro Leu Pro Val Asp Met Val Leu Ile Ser Leu Cys Phe Gly Leu Ser
65 70 75 80

Ile Ala Thr Met Val Gln Cys Phe Gly His Ile Ser Gly Gly His Ile
85 90 95

Asn Pro Ala Val Thr Val Ala Met Val Cys Thr Arg Lys Ile Ser Ile
100 105 110

Ala Lys Ser Val Phe Tyr Ile Ala Ala Gln Cys Leu Gly Ala Ile Ile
115 120 125

Gly Ala Gly Ile Leu Tyr Leu Val Thr Pro Pro Ser Val Val Gly Gly
130 135 140

```
Leu Gly Val Thr Met Val His Gly Asn Leu Thr Ala Gly His Gly Leu
145                 150                 155                 160

Leu Val Glu Leu Ile Ile Thr Phe Gln Leu Val Phe Thr Ile Phe Ala
                165                 170                 175

Ser Cys Asp Ser Lys Arg Thr Asp Val Thr Gly Ser Ile Ala Leu Ala
            180                 185                 190

Ile Gly Phe Ser Val Ala Ile Gly His Leu Phe Ala Ile Asn Tyr Thr
        195                 200                 205

Gly Ala Ser Met Asn Pro Ala Arg Ser Phe Gly Pro Ala Val Ile Met
    210                 215                 220

Gly Asn Trp Glu Asn His Trp Ile Tyr Trp Val Gly Pro Ile Ile Gly
225                 230                 235                 240

Ala Val Leu Ala Gly Gly Leu Tyr Glu Tyr Val Phe Cys Pro Asp Val
                245                 250                 255

Glu Phe Lys Arg Arg Phe Lys Glu Ala Phe Ser Lys Ala Ala Gln Gln
            260                 265                 270

Thr Lys Gly Ser Tyr Met Glu Val Glu Asp Asn Arg Ser Gln Val Glu
        275                 280                 285

Thr Asp Asp Leu Ile Leu Lys Pro Gly Val Val His Val Ile Asp Val
    290                 295                 300

Asp Arg Gly Glu Glu Lys Lys Gly Lys Asp Gln Ser Gly Glu Val Leu
305                 310                 315                 320

Ser Ser Val
```

<210> 4980
<211> 582
<212> PRT
<213> Homo sapiens

<400> 4980

```
Met Ile Phe Leu Thr Ala Leu Pro Leu Phe Trp Ile Met Ile Ser Ala
1               5                   10                  15

Ser Arg Gly Gly His Trp Gly Ala Trp Met Pro Ser Ser Ile Ser Ala
            20                  25                  30
```

```
Phe Glu Gly Thr Cys Val Ser Ile Pro Cys Arg Phe Asp Phe Pro Asp
        35                  40                  45

Glu Leu Arg Pro Ala Val Val His Gly Val Trp Tyr Phe Asn Ser Pro
    50                  55                  60

Tyr Pro Lys Asn Tyr Pro Pro Val Val Phe Lys Ser Arg Thr Gln Val
65                  70                  75                  80

Val His Glu Ser Phe Gln Gly Arg Ser Arg Leu Leu Gly Asp Leu Gly
                85                  90                  95

Leu Arg Asn Cys Thr Leu Leu Leu Ser Asn Val Ser Pro Glu Leu Gly
            100                 105                 110

Gly Lys Tyr Tyr Phe Arg Gly Asp Leu Gly Gly Tyr Asn Gln Tyr Thr
        115                 120                 125

Phe Ser Glu His Ser Val Leu Asp Ile Val Asn Thr Pro Asn Ile Val
    130                 135                 140

Val Pro Pro Glu Val Val Ala Gly Thr Glu Val Glu Val Ser Cys Met
145                 150                 155                 160

Val Pro Asp Asn Cys Pro Glu Leu Arg Pro Glu Leu Ser Trp Leu Gly
                165                 170                 175

His Glu Gly Leu Gly Glu Pro Ala Val Leu Gly Arg Leu Arg Glu Asp
            180                 185                 190

Glu Gly Thr Trp Val Gln Val Ser Leu Leu His Phe Val Pro Thr Arg
        195                 200                 205

Glu Ala Asn Gly His Arg Leu Gly Cys Gln Ala Ser Phe Pro Asn Thr
    210                 215                 220

Thr Leu Gln Phe Glu Gly Tyr Ala Ser Met Asp Val Lys Tyr Pro Pro
225                 230                 235                 240

Val Ile Val Glu Met Asn Ser Ser Val Glu Ala Ile Glu Gly Ser His
                245                 250                 255

Val Ser Leu Leu Cys Gly Ala Asp Ser Asn Pro Pro Pro Leu Leu Thr
            260                 265                 270

Trp Met Arg Asp Gly Thr Val Leu Arg Glu Ala Val Ala Glu Ser Leu
        275                 280                 285
```

```
Leu Leu Glu Leu Glu Glu Val Thr Pro Ala Glu Asp Gly Val Tyr Ala
    290                 295                 300

Cys Leu Ala Glu Asn Ala Tyr Gly Gln Asp Asn Arg Thr Val Gly Leu
305                 310                 315                 320

Ser Val Met Tyr Ala Pro Trp Lys Pro Thr Val Asn Gly Thr Met Val
                325                 330                 335

Ala Val Glu Gly Glu Thr Val Ser Ile Leu Cys Ser Thr Gln Ser Asn
            340                 345                 350

Pro Asp Pro Ile Leu Thr Ile Phe Lys Glu Lys Gln Ile Leu Ser Thr
        355                 360                 365

Val Ile Tyr Glu Ser Glu Leu Gln Leu Glu Leu Pro Ala Val Ser Pro
    370                 375                 380

Glu Asp Asp Gly Glu Tyr Trp Cys Val Ala Glu Asn Gln Tyr Gly Gln
385                 390                 395                 400

Arg Ala Thr Ala Phe Asn Leu Ser Val Glu Phe Ala Pro Val Leu Leu
                405                 410                 415

Leu Glu Ser His Cys Ala Ala Ala Arg Asp Thr Val Gln Cys Leu Cys
            420                 425                 430

Val Val Lys Ser Asn Pro Glu Pro Ser Val Ala Phe Glu Leu Pro Ser
        435                 440                 445

Arg Asn Val Thr Val Asn Glu Ser Glu Arg Glu Phe Val Tyr Ser Glu
    450                 455                 460

Arg Ser Gly Leu Val Leu Thr Ser Ile Leu Thr Leu Arg Gly Gln Ala
465                 470                 475                 480

Gln Ala Pro Pro Arg Val Ile Cys Thr Ala Arg Asn Leu Tyr Gly Ala
                485                 490                 495

Lys Ser Leu Glu Leu Pro Phe Gln Gly Ala His Arg Leu Met Trp Ala
            500                 505                 510

Lys Ile Gly Pro Val Gly Ala Val Val Ala Phe Ala Ile Leu Ile Ala
        515                 520                 525

Ile Val Cys Tyr Ile Thr Gln Thr Arg Arg Lys Lys Asn Val Thr Glu
    530                 535                 540
```

```
Ser Pro Ser Phe Ser Ala Gly Asp Asn Pro Pro Val Leu Phe Ser Ser
545                 550                 555                 560


Asp Phe Arg Ile Ser Gly Ala Pro Glu Lys Tyr Glu Ser Lys Glu Val
                565                 570                 575


Ser Thr Leu Glu Ser His
            580


<210>  4981
<211>  110
<212>  PRT
<213>  Homo sapiens

<400>  4981

Met Ala Leu Trp Met Arg Leu Leu Pro Leu Leu Ala Leu Leu Ala Leu
1               5                   10                  15


Trp Gly Pro Asp Pro Ala Ala Ala Phe Val Asn Gln His Leu Cys Gly
            20                  25                  30


Ser His Leu Val Glu Ala Leu Tyr Leu Val Cys Gly Glu Arg Gly Phe
        35                  40                  45


Phe Tyr Thr Pro Lys Thr Arg Arg Glu Ala Glu Asp Leu Gln Val Gly
    50                  55                  60


Gln Val Glu Leu Gly Gly Gly Pro Gly Ala Gly Ser Leu Gln Pro Leu
65                  70                  75                  80


Ala Leu Glu Gly Ser Leu Gln Lys Arg Gly Ile Val Glu Gln Cys Cys
                85                  90                  95


Thr Ser Ile Cys Ser Leu Tyr Gln Leu Glu Asn Tyr Cys Asn
            100                 105                 110


<210>  4982
<211>  180
<212>  PRT
<213>  Homo sapiens

<400>  4982

Ile Ala Pro Val Phe Val Leu Met Glu Gln Ile Thr Leu Lys Lys Met
1               5                   10                  15


Arg Lys Ile Val Gly Trp Ser Asn Lys Asp Gly Asp Gly Ile Phe Ser
            20                  25                  30
```

```
Pro Gly Gly Ala Ile Ser Asn Met Tyr Ser Ile Met Ala Ala Arg Tyr
        35                  40                  45

Lys Tyr Phe Pro Glu Val Lys Thr Lys Gly Met Ala Ala Val Pro Lys
    50                  55                  60

Leu Val Leu Phe Thr Ser Glu His Ser His Tyr Ser Ile Lys Lys Ala
65                  70                  75                  80

Gly Ala Ala Leu Gly Phe Gly Thr Asp Asn Val Ile Leu Ile Lys Cys
                85                  90                  95

Asn Glu Arg Gly Lys Ile Ile Pro Ala Asp Leu Glu Ala Lys Ile Leu
            100                 105                 110

Asp Ala Lys Gln Lys Gly Tyr Val Pro Leu Tyr Val Asn Ala Thr Ala
        115                 120                 125

Gly Thr Thr Val Tyr Gly Ala Phe Asp Pro Ile Gln Glu Ile Ala Asp
    130                 135                 140

Ile Cys Glu Lys Tyr Asn Leu Trp Leu His Val Asp Ala Ala Trp Gly
145                 150                 155                 160

Gly Gly Leu Leu Met Ser Arg Lys His Arg His Lys Leu Ser Gly Ile
                165                 170                 175

Glu Arg Ala Asn
            180


<210>  4983
<211>  296
<212>  PRT
<213>  Triticum urartu

<400>  4983

Met Lys Thr Phe Leu Ile Leu Ala Leu Leu Ala Ile Val Ala Thr Thr
1               5                   10                  15

Ala Thr Thr Ala Val Arg Val Pro Val Pro Gln Pro Gln Pro Gln Asn
            20                  25                  30

Pro Ser Gln Pro Gln Pro Gln Arg Gln Val Pro Leu Val Gln Gln Gln
        35                  40                  45

Gln Phe Pro Gly Gln Gln Gln Gln Phe Pro Pro Gln Gln Pro Tyr Pro
    50                  55                  60
```

```
Gln Pro Gln Pro Phe Pro Ser Gln Gln Pro Tyr Leu Gln Leu Gln Pro
65                  70                  75                  80

Phe Pro Gln Pro Gln Pro Phe Pro Pro Gln Leu Pro Tyr Pro Gln Pro
                85                  90                  95

Pro Pro Phe Ser Pro Gln Gln Pro Tyr Pro Gln Pro Gln Pro Gln Tyr
            100                 105                 110

Pro Gln Pro Gln Gln Pro Ile Ser Gln Gln Gln Ala Gln Gln Gln Gln
        115                 120                 125

Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Ile Leu
    130                 135                 140

Pro Gln Ile Leu Gln Gln Gln Leu Ile Pro Cys Arg Asp Val Val Leu
145                 150                 155                 160

Gln Gln His Asn Ile Ala His Ala Arg Ser Gln Val Leu Gln Gln Ser
                165                 170                 175

Thr Tyr Gln Pro Leu Gln Gln Leu Cys Cys Gln Gln Leu Trp Gln Ile
            180                 185                 190

Pro Glu Gln Ser Arg Cys Gln Ala Ile His Asn Val Val His Ala Ile
        195                 200                 205

Ile Leu His Gln Gln Gln Gln Gln Gln Gln Pro Ser Ser Gln Val Ser
    210                 215                 220

Leu Gln Gln Pro Gln Gln Gln Tyr Pro Ser Gly Gln Gly Phe Phe Gln
225                 230                 235                 240

Pro Ser Gln Gln Asn Pro Gln Ala Gln Gly Ser Val Gln Pro Gln Gln
                245                 250                 255

Leu Pro Gln Phe Glu Glu Ile Arg Asn Leu Ala Leu Gln Thr Leu Pro
            260                 265                 270

Arg Met Cys Asn Val Tyr Ile Pro Pro Tyr Cys Ser Thr Thr Thr Ala
        275                 280                 285

Pro Phe Gly Ile Phe Gly Thr Asn
    290                 295
```

<210> 4984
<211> 275

<212> PRT
<213> Triticum durum

<400> 4984

```
Met Asn Ile Gln Val Asp Pro Ser Ser Gln Val Gln Trp Pro Gln Gln
1               5                  10                  15

Gln Pro Phe Leu Gln Pro His Gln Pro Phe Ser Gln Gln Pro Gln Gln
            20                  25                  30

Ile Phe Pro Gln Pro Gln Gln Thr Phe Pro His Gln Pro Gln Gln Gln
        35                  40                  45

Phe Pro Gln Pro Gln Gln Pro Gln Arg Gln Phe Leu Gln Pro Arg Gln
    50                  55                  60

Pro Phe Pro Gln Gln Pro Gln Gln Pro Tyr Pro Gln Gln Pro Gln Gln
65                  70                  75                  80

Pro Phe Pro Gln Thr Gln Gln Pro Gln Gln Pro Phe Pro Gln Ser Lys
                85                  90                  95

Gln Pro Gln Gln Pro Phe Pro Gln Pro Gln Gln Pro Gln Gln Ser Phe
            100                 105                 110

Pro Gln Gln Gln Pro Ser Leu Ile Gln Gln Ser Leu Gln Gln Gln Leu
        115                 120                 125

Asn Pro Cys Lys Asn Phe Leu Leu Gln Gln Cys Lys Pro Val Ser Leu
    130                 135                 140

Val Ser Ser Leu Trp Ser Ile Ile Leu Pro Pro Ser Asp Cys Gln Val
145                 150                 155                 160

Met Arg Gln Gln Cys Cys Gln Gln Leu Ala Gln Ile Pro Gln Gln Leu
                165                 170                 175

Gln Cys Ala Ala Ile His Ser Val Val His Ser Ile Ile Met Gln Gln
            180                 185                 190

Glu Gln Gln Glu Gln Leu Gln Gly Val Gln Ile Leu Val Pro Leu Ser
        195                 200                 205

Gln Gln Gln Gln Val Gly Gln Gly Ile Leu Val Gln Gly Gln Gly Ile
    210                 215                 220

Ile Gln Pro Gln Gln Pro Ala Gln Leu Glu Val Ile Arg Ser Leu Val
225                 230                 235                 240
```

```
Leu Gln Thr Leu Pro Thr Met Cys Asn Val Tyr Val Pro Pro Tyr Cys
                245                 250                 255

Ser Thr Ile Arg Ala Pro Phe Ala Ser Ile Val Ala Gly Ile Gly Gly
            260                 265                 270

Gln Tyr Arg
        275
```

<210> 4985
<211> 282
<212> PRT
<213> Triticum aestivum

<400> 4985

```
Met Asn Ile Gln Val Asp Pro Ser Ser Gln Val Pro Trp Pro Gln Gln
1               5                   10                  15

Gln Pro Phe Pro Gln Pro His Gln Pro Phe Ser Gln Gln Pro Gln Gln
            20                  25                  30

Thr Phe Pro Gln Pro Gln Gln Thr Phe Pro His Gln Pro Gln Gln Gln
        35                  40                  45

Phe Ser Gln Pro Gln Gln Pro Gln Gln Gln Phe Ile Gln Pro Gln Gln
    50                  55                  60

Pro Phe Pro Gln Gln Pro Gln Gln Thr Tyr Pro Gln Arg Pro Gln Gln
65                  70                  75                  80

Pro Phe Pro Gln Thr Gln Gln Pro Gln Gln Pro Phe Pro Gln Ser Gln
                85                  90                  95

Gln Pro Gln Gln Pro Phe Pro Gln Pro Gln Gln Gln Phe Pro Gln Pro
            100                 105                 110

Gln Gln Pro Gln Gln Ser Phe Pro Gln Gln Gln Pro Ser Leu Ile Gln
        115                 120                 125

Gln Ser Leu Gln Gln Gln Leu Asn Pro Cys Lys Asn Phe Leu Leu Gln
    130                 135                 140

Gln Cys Lys Pro Val Ser Leu Val Ser Ser Leu Trp Ser Met Ile Leu
145                 150                 155                 160

Pro Arg Ser Asp Cys Gln Val Met Arg Gln Gln Cys Cys Gln Gln Leu
                165                 170                 175
```

```
Ala Gln Ile Pro Gln Gln Leu Gln Cys Ala Ala Ile His Ser Ile Val
            180                 185                 190


His Ser Ile Ile Met Gln Gln Glu Gln Gln Glu Gln Arg Gln Gly Val
        195                 200                 205


Gln Ile Leu Val Pro Leu Ser Gln Gln Gln Gln Val Gly Gln Gly Thr
    210                 215                 220


Leu Val Gln Gly Gln Gly Ile Ile Gln Pro Gln Gln Pro Ala Gln Leu
225                 230                 235                 240


Glu Val Ile Arg Ser Leu Val Leu Gln Thr Leu Ala Thr Met Cys Asn
                245                 250                 255


Val Tyr Val Pro Pro Tyr Cys Ser Thr Ile Arg Ala Pro Phe Ala Ser
            260                 265                 270


Ile Val Ala Gly Ile Gly Gly Gln Tyr Arg
        275                 280


<210>  4986
<211>  9
<212>  PRT
<213>  Triticum sp.

<400>  4986

Pro Phe Pro Gln Pro Glu Leu Pro Tyr
1               5


<210>  4987
<211>  9
<212>  PRT
<213>  Triticum sp.

<400>  4987

Pro Tyr Pro Gln Pro Glu Leu Pro Tyr
1               5


<210>  4988
<211>  9
<212>  PRT
<213>  Triticum sp.

<400>  4988

Pro Gln Pro Glu Leu Pro Tyr Pro Trp
1               5
```

<210> 4989
<211> 10
<212> PRT
<213> Triticum sp.

<400> 4989

Phe Arg Pro Pro Glu Gln Pro Tyr Pro Gln
1 5 10

<210> 4990
<211> 9
<212> PRT
<213> Triticum sp.

<400> 4990

Pro Gln Gln Ser Phe Pro Glu Gln Gln
1 5

<210> 4991
<211> 9
<212> PRT
<213> Triticum sp.

<400> 4991

Ile Gln Pro Glu Gln Pro Ala Gln Leu
1 5

<210> 4992
<211> 9
<212> PRT
<213> Triticum sp.

<400> 4992

Gln Gln Pro Glu Gln Pro Tyr Pro Gln
1 5

<210> 4993
<211> 9
<212> PRT
<213> Triticum sp.

<400> 4993

Ser Gln Pro Glu Gln Glu Phe Pro Gln
1 5

<210> 4994
<211> 9
<212> PRT
<213> Triticum sp.

<400> 4994

Pro Gln Pro Glu Gln Glu Phe Pro Gln

1 5

<210> 4995
<211> 9
<212> PRT
<213> Triticum sp.

<400> 4995

Gln Gln Pro Glu Gln Pro Phe Pro Gln
1 5

<210> 4996
<211> 9
<212> PRT
<213> Triticum sp.

<400> 4996

Pro Gln Pro Glu Gln Pro Phe Cys Gln
1 5

<210> 4997
<211> 9
<212> PRT
<213> Triticum sp.

<400> 4997

Gln Gln Pro Phe Pro Glu Gln Pro Gln
1 5

<210> 4998
<211> 9
<212> PRT
<213> Triticum sp.

<400> 4998

Pro Phe Pro Gln Pro Glu Gln Pro Phe
1 5

<210> 4999
<211> 9
<212> PRT
<213> Triticum sp.

<400> 4999

Pro Gln Pro Glu Gln Pro Phe Pro Trp
1 5

<210> 5000
<211> 9
<212> PRT
<213> Triticum sp.

<400> 5000

Pro Phe Ser Glu Gln Glu Gln Pro Val
1 5

<210> 5001
<211> 9
<212> PRT
<213> Triticum sp.

<400> 5001

Phe Ser Gln Gln Gln Glu Ser Pro Phe
1 5

<210> 5002
<211> 9
<212> PRT
<213> Triticum sp.

<400> 5002

Pro Phe Pro Gln Pro Glu Gln Pro Phe
1 5

<210> 5003
<211> 9
<212> PRT
<213> Triticum sp.

<400> 5003

Pro Gln Pro Glu Gln Pro Phe Pro Gln
1 5

<210> 5004
<211> 9
<212> PRT
<213> Triticum sp.

<400> 5004

Pro Ile Pro Glu Gln Pro Gln Pro Tyr
1 5

<210> 5005
<211> 9
<212> PRT
<213> Triticum sp.

<400> 5005

Pro Phe Pro Gln Pro Glu Gln Pro Phe
1 5

<210> 5006
<211> 9

<212> PRT
<213> Triticum sp.

<400> 5006

Pro Gln Pro Glu Gln Pro Phe Pro Gln
1 5

<210> 5007
<211> 9
<212> PRT
<213> Triticum sp.

<400> 5007

Pro Tyr Pro Glu Gln Glu Glu Pro Phe
1 5

<210> 5008
<211> 9
<212> PRT
<213> Triticum sp.

<400> 5008

Pro Tyr Pro Glu Gln Glu Gln Pro Phe
1 5

<210> 5009
<211> 9
<212> PRT
<213> Triticum sp.

<400> 5009

Pro Phe Ser Glu Gln Glu Gln Pro Val
1 5

<210> 5010
<211> 9
<212> PRT
<213> Triticum sp.

<400> 5010

Glu Gly Ser Phe Gln Pro Ser Gln Glu
1 5

<210> 5011
<211> 9
<212> PRT
<213> Triticum sp.

<400> 5011

Glu Gln Pro Gln Gln Pro Phe Pro Gln
1 5

<210> 5012
<211> 9
<212> PRT
<213> Triticum sp.

<400> 5012

Glu Gln Pro Gln Gln Pro Tyr Pro Glu
1 5

<210> 5013
<211> 9
<212> PRT
<213> Triticum sp.

<400> 5013

Gln Phe Tyr Tyr Pro Thr Ser Pro Gln
1 5

<210> 5014
<211> 9
<212> PRT
<213> Triticum sp.

<400> 5014

Glu Gly Ser Phe Gln Pro Ser Gln Glu
1 5

<210> 5015
<211> 9
<212> PRT
<213> Triticum sp.

<400> 5015

Pro Gln Gln Ser Phe Pro Glu Gln Glu
1 5

<210> 5016
<211> 9
<212> PRT
<213> Triticum sp.

<400> 5016

Gln Phe Tyr Tyr Pro Thr Ser Pro Gln
1 5

<210> 5017
<211> 239
<212> PRT
<213> Homo sapiens

<400> 5017

```
Arg Gly Asp Ser Gly Ser Pro Ala Thr Trp Thr Thr Arg Gly Phe Val
1               5                  10                  15

Phe Thr Arg His Ser Gln Thr Thr Ala Ile Pro Ser Cys Pro Glu Gly
            20                  25                  30

Thr Val Pro Leu Tyr Ser Gly Phe Ser Phe Leu Phe Val Gln Gly Asn
        35                  40                  45

Gln Arg Ala His Gly Gln Asp Leu Gly Thr Leu Gly Ser Cys Leu Gln
    50                  55                  60

Arg Phe Thr Thr Met Pro Phe Leu Phe Cys Asn Val Asn Asp Val Cys
65                  70                  75                  80

Asn Phe Ala Ser Arg Asn Asp Tyr Ser Tyr Trp Leu Ser Thr Pro Ala
                85                  90                  95

Leu Met Pro Met Asn Met Ala Pro Ile Thr Gly Arg Ala Leu Glu Pro
            100                 105                 110

Tyr Ile Ser Arg Cys Thr Val Cys Glu Gly Pro Ala Ile Ala Ile Ala
        115                 120                 125

Val His Ser Gln Thr Thr Asp Ile Pro Pro Cys Pro His Gly Trp Ile
    130                 135                 140

Ser Leu Trp Lys Gly Phe Ser Phe Ile Met Phe Thr Ser Ala Gly Ser
145                 150                 155                 160

Glu Gly Thr Gly Gln Ala Leu Ala Ser Pro Gly Ser Cys Leu Glu Glu
                165                 170                 175

Phe Arg Ala Ser Pro Phe Leu Glu Cys His Gly Arg Gly Thr Cys Asn
            180                 185                 190

Tyr Tyr Ser Asn Ser Tyr Ser Phe Trp Leu Ala Ser Leu Asn Pro Glu
        195                 200                 205

Arg Met Phe Arg Lys Pro Ile Pro Ser Thr Val Lys Ala Gly Glu Leu
    210                 215                 220

Glu Lys Ile Ile Ser Arg Cys Gln Val Cys Met Lys Lys Arg His
225                 230                 235
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<210> 5018
<211> 20
<212> PRT

<213> Homo sapiens

<400> 5018

Ser Pro Ala Thr Trp Thr Thr Arg Gly Phe Val Phe Thr Arg His Ser
1 5 10 15

Gln Thr Thr Ala
20

<210> 5019
<211> 21
<212> PRT
<213> Homo sapiens

<400> 5019

Val Phe Thr Arg His Ser Gln Thr Thr Ala Ile Pro Ser Cys Pro Glu
1 5 10 15

Gly Thr Val Pro Leu
20

<210> 5020
<211> 20
<212> PRT
<213> Homo sapiens

<400> 5020

Ile Pro Ser Cys Pro Glu Gly Thr Val Pro Leu Tyr Ser Gly Phe Ser
1 5 10 15

Phe Leu Phe Val
20

<210> 5021
<211> 20
<212> PRT
<213> Homo sapiens

<400> 5021

Leu Tyr Ser Gly Phe Ser Phe Leu Phe Val Gln Gly Asn Gln Arg Ala
1 5 10 15

His Gly Gln Asp
20

<210> 5022
<211> 20
<212> PRT
<213> Homo sapiens

<400> 5022

Phe Thr Thr Met Pro Phe Leu Phe Cys Asn Val Asn Asp Val Cys Asn
1 5 10 15

Phe Ala Ser Arg
20

<210> 5023
<211> 21
<212> PRT
<213> Homo sapiens

<400> 5023

Val Asn Asp Val Cys Asn Phe Ala Ser Arg Asn Asp Tyr Ser Tyr Trp
1 5 10 15

Leu Ser Thr Pro Ala
20

<210> 5024
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<213> Homo sapiens

<400> 5024

Thr Gly Arg Ala Leu Glu Pro Tyr Ile Ser Arg Cys Thr Val Cys Glu
1 5 10 15

Gly Pro Ala Ile
20

<210> 5025
<211> 19
<212> PRT
<213> Homo sapiens

<400> 5025

Arg Cys Thr Val Cys Glu Pro Ala Ile Ala Ile Ala Val His Ser Gln
1 5 10 15

Thr Thr Asp

<210> 5026
<211> 20
<212> PRT
<213> Homo sapiens

<400> 5026

Ile Pro Pro Cys Pro His Gly Trp Ile Ser Leu Trp Lys Gly Phe Ser
1 5 10 15

Phe Ile Met Phe
20

<210> 5027
<211> 20
<212> PRT
<213> Homo sapiens

<400> 5027

Leu Trp Lys Gly Phe Ser Phe Ile Met Phe Thr Ser Ala Gly Ser Glu
1 5 10 15

Gly Thr Gln Gly
20

<210> 5028
<211> 20
<212> PRT
<213> Homo sapiens

<400> 5028

Asn Ser Tyr Ser Phe Trp Leu Ala Ser Leu Asn Pro Glu Arg Met Phe
1 5 10 15

Arg Lys Pro Ile
20

<210> 5029
<211> 19
<212> PRT
<213> Mus musculus

<400> 5029

Ala Thr Gly Thr Arg Met Arg Gly Phe Ile Phe Thr Arg His Ser Thr
1 5 10 15

Thr Ala Ile

<210> 5030
<211> 20
<212> PRT
<213> Mus musculus

<400> 5030

Phe Ile Phe Thr Arg His Ser Gln Thr Thr Ala Ile Pro Ser Cys Pro
1 5 10 15

Glu Gly Thr Gln

20

<210> 5031
<211> 20
<212> PRT
<213> Mus musculus

<400> 5031

Thr Thr Ala Ile Pro Ser Cys Pro Glu Gly Thr Gln Pro Leu Tyr Ser
1 5 10 15

Gly Phe Ser Leu
20

<210> 5032
<211> 20
<212> PRT
<213> Mus musculus

<400> 5032

Glu Gly Thr Gln Pro Leu Tyr Ser Gly Phe Ser Leu Leu Phe Val Gln
1 5 10 15

Gly Asn Lys Arg
20

<210> 5033
<211> 20
<212> PRT
<213> Mus musculus

<400> 5033

Phe Leu Phe Cys Asn Ile Asn Asn Val Cys Asn Phe Ala Ser Arg Asn
1 5 10 15

Asp Tyr Ser Tyr
20

<210> 5034
<211> 20
<212> PRT
<213> Mus musculus

<400> 5034

Val Cys Asn Phe Ala Ser Arg Asn Asp Tyr Ser Tyr Trp Leu Ser Thr
1 5 10 15

Pro Ala Leu Met
20

<210> 5035
<211> 20
<212> PRT
<213> Mus musculus

<400> 5035

Ala Pro Ile Ser Gly Arg Ala Leu Glu Pro Tyr Ile Ser Arg Cys Thr
1 5 10 15

Val Cys Glu Gly
20

<210> 5036
<211> 20
<212> PRT
<213> Mus musculus

<400> 5036

Glu Pro Tyr Ile Ser Arg Cys Thr Val Cys Glu Gly Pro Ala Met Ala
1 5 10 15

Ile Ala Val His
20

<210> 5037
<211> 20
<212> PRT
<213> Mus musculus

<400> 5037

Ala Ile Pro Pro Cys Pro Gln Asp Trp Val Ser Leu Trp Lys Gly Phe
1 5 10 15

Ser Phe Ile Met
20

<210> 5038
<211> 21
<212> PRT
<213> Mus musculus

<400> 5038

Trp Val Ser Leu Trp Lys Gly Glu Phe Ser Phe Ile Met Phe Thr Ser
1 5 10 15

Ala Gly Ser Glu Gly
20

<210> 5039
<211> 20
<212> PRT

<213> Mus musculus

<400> 5039

Ser Phe Trp Leu Ala Ser Leu Asn Pro Glu Arg Met Phe Arg Lys Pro
1 5 10 15

Ile Pro Ser Thr
20

<210> 5040
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5040

Pro Gln Pro Phe Pro Pro Gln Leu Pro Tyr Pro Gln Pro Gln Leu Pro
1 5 10 15

Tyr Pro Gln Pro
20

<210> 5041
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5041

Met Gln Leu Gln Pro Phe Pro Gln Pro Gln Leu Pro Tyr Pro Gln Pro
1 5 10 15

Gln Leu Pro Tyr
20

<210> 5042
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5042

Gln Pro Phe Pro Gln Pro Gln Gln Pro Phe Pro Trp Gln Pro Gln Gln
1 5 10 15

Pro Phe Pro Gln
20

<210> 5043
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5043

Pro Gln Gln Pro Gln Gln Pro Phe Pro Gln Pro Gln Gln Pro Ile Pro
1 5 10 15

Val Gln Pro Gln
20

<210> 5044
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5044

Pro Gln Gln Gln Gln Pro Phe Pro Gln Pro Gln Gln Pro Phe Ser Gln
1 5 10 15

Gln Pro Gln Gln
20

<210> 5045
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5045

Gln Gln Pro Gln Gln Pro Phe Pro Gln Pro Gln Leu Pro Phe Pro Gln
1 5 10 15

Gln Ser Glu Gln
20

<210> 5046
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5046

Trp Pro Gln Gln Gln Pro Phe Pro Gln Pro Gln Gln Pro Phe Cys Gln
1 5 10 15

Gln Pro Gln Gln
20

<210> 5047
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5047

Leu Gln Leu Gln Pro Phe Pro Gln Pro Gln Leu Pro Tyr Ser Gln Pro
1 5 10 15

Gln Pro Phe Arg
20

<210> 5048
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5048

Leu Gln Pro Phe Pro Gln Pro Gln Pro Phe Leu Pro Gln Leu Pro Tyr
1 5 10 15

Pro Gln Pro Gln
20

<210> 5049
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5049

Ser Gln Gln Pro Gln Gln Gln Phe Ser Gln Pro Gln Gln Gln Phe Pro
1 5 10 15

Gln Pro Gln Gln
20

<210> 5050
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5050

Gln Ala Phe Pro Gln Pro Gln Gln Thr Phe Pro His Gln Pro Gln Gln
1 5 10 15

Gln Phe Pro Gln
20

<210> 5051
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5051

Cys Lys Val Phe Leu Gln Gln Gln Cys Ser Pro Val Ala Met Pro Gln
1 5 10 15

Arg Leu Ala Arg

20

<210> 5052
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5052

Leu Gln Leu Gln Pro Phe Pro Gln Pro Gln Leu Pro Tyr Leu Gln Pro
1 5 10 15

Gln Pro Phe Arg
20

<210> 5053
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5053

Gln Gln Gln Phe Ile Gln Pro Gln Gln Pro Phe Pro Gln Gln Pro Gln
1 5 10 15

Gln Thr Tyr Pro
20

<210> 5054
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5054

Ser His Ile Pro Gly Leu Glu Arg Pro Trp Gln Gln Gln Pro Leu Pro
1 5 10 15

Pro Gln Gln Thr
20

<210> 5055
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5055

Ser Gln Gln Pro Gln Gln Pro Phe Pro Gln Pro Gln Gln Gln Phe Pro
1 5 10 15

Gln Pro Gln Gln
20

<210> 5056
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5056

Gln Gln Pro Phe Pro Gln Pro Gln Gln Pro Gln Leu Pro Phe Pro Gln
1 5 10 15

Gln Pro Gln Gln
20

<210> 5057
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5057

Pro Gln Leu Pro Tyr Pro Gln Pro Gln Leu Pro Tyr Pro Gln Pro Gln
1 5 10 15

Pro Phe Arg Pro
20

<210> 5058
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5058

Gln Pro Phe Pro Gln Pro Gln Gln Pro Phe Pro Trp Gln Pro Gln Gln
1 5 10 15

Pro Phe Pro Gln
20

<210> 5059
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5059

Phe Pro Glu Leu Gln Gln Pro Ile Pro Gln Gln Pro Gln Gln Pro Phe
1 5 10 15

Pro Leu Gln Pro
20

<210> 5060
<211> 20
<212> PRT

<213> Triticum sp.

<400> 5060

Gln Gly Gln Gln Gly Tyr Tyr Pro Ile Ser Pro Gln Gln Ser Gly Gln
1 5 10 15

Gly Gln Gln Pro
20

<210> 5061
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5061

Leu Gln Pro Gly Gln Gly Gln Pro Gly Tyr Tyr Pro Thr Ser Pro Gln
1 5 10 15

Gln Ile Gly Gln
20

<210> 5062
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5062

Gln Gln Phe Leu Gln Pro Gln Gln Pro Phe Pro Gln Gln Pro Gln Gln
1 5 10 15

Pro Tyr Pro Gln
20

<210> 5063
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5063

Pro Gly Gln Gly Gln Ser Gly Tyr Tyr Pro Thr Ser Pro Gln Gln Ser
1 5 10 15

Gly Gln Lys Gln
20

<210> 5064
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5064

Thr Pro Ile Gln Pro Gln Gln Pro Phe Pro Gln Gln Pro Gln Gln Pro
1 5 10 15

Gln Gln Pro Phe
20

<210> 5065
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5065

Pro Gln Gln Pro Gln Gln Pro Phe Pro Leu Gln Pro Gln Gln Pro Phe
1 5 10 15

Pro Gln Gln Pro
20

<210> 5066
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5066

Pro Phe Thr Gln Pro Gln Gln Pro Thr Pro Ile Gln Pro Gln Gln Pro
1 5 10 15

Phe Pro Gln Gln
20

<210> 5067
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5067

Pro Gln Gln Pro Phe Pro Gln Pro Gln Gln Thr Phe Pro Gln Gln Pro
1 5 10 15

Gln Leu Pro Phe
20

<210> 5068
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5068

Gly Gln Gly Gln Ser Gly Tyr Tyr Pro Thr Ser Pro Gln Gln Ser Gly
1 5 10 15

Gln Glu Ala Thr
20

<210> 5069
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5069

Pro Leu Gln Pro Gln Gln Pro Phe Pro Gln Gln Pro Gln Gln Pro Phe
1 5 10 15

Pro Gln Pro Gln
20

<210> 5070
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5070

Gln Pro Phe Pro Gln Leu Gln Gln Pro Gln Gln Pro Leu Pro Gln Pro
1 5 10 15

Gln Gln Pro Gln
20

<210> 5071
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5071

Gln Gln Pro Phe Pro Gln Gln Pro Gln Gln Pro Phe Pro Gln Pro Gln
1 5 10 15

Gln Pro Ile Pro
20

<210> 5072
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5072

Pro Gln Gln Pro Phe Pro Gln Pro Gln Gln Thr Phe Pro Gln Gln Pro
1 5 10 15

Gln Leu Pro Phe

20

<210> 5073
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5073

Val Ala His Ala Ile Ile Met His Gln Gln Gln Gln Gln Gln Gln Glu
1 5 10 15

Gln Lys Gln Gln
20

<210> 5074
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5074

Pro Gln Gln Pro Phe Pro Gln Gln Pro Gln Gln Gln Phe Pro Gln Pro
1 5 10 15

Gln Gln Pro Gln
20

<210> 5075
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5075

Gln Gln Pro Ala Gln Tyr Glu Val Ile Arg Ser Leu Val Leu Arg Thr
1 5 10 15

Leu Pro Asn Met
20

<210> 5076
<211> 20
<212> PRT
<213> Triticum sp.

<400> 5076

Ala Thr Ala Asn Met Gln Val Asp Pro Ser Gly Gln Val Gln Trp Pro
1 5 10 15

Gln Gln Gln Pro
20

<210> 5077
<211> 20
<212> PRT
<213> Hordeum vulgare

<400> 5077

Gln Pro Phe Pro Gln Pro Gln Gln Pro Phe Pro Trp Gln Pro Gln Gln
1 5 10 15

Pro Phe Pro Gln
20

<210> 5078
<211> 20
<212> PRT
<213> Hordeum vulgare

<400> 5078

Trp Gln Pro Gln Gln Pro Phe Pro Gln Pro Gln Gln Pro Phe Pro Leu
1 5 10 15

Gln Pro Gln Gln
20

<210> 5079
<211> 20
<212> PRT
<213> Hordeum vulgare

<400> 5079

Gln Pro Gln Gln Pro Phe Pro Gln Pro Gln Gln Pro Ile Pro Tyr Gln
1 5 10 15

Pro Gln Gln Pro
20

<210> 5080
<211> 20
<212> PRT
<213> Hordeum vulgare

<400> 5080

Gln Pro Gln Gln Pro Gln Pro Phe Pro Gln Gln Pro Val Pro Gln Gln
1 5 10 15

Pro Gln Pro Tyr
20

<210> 5081
<211> 20
<212> PRT

<213> Hordeum vulgare

<400> 5081

Pro Gln Pro Phe Pro Gln Gln Pro Ile Pro Gln Gln Pro Gln Pro Tyr
1 5 10 15

Pro Gln Gln Pro
20

<210> 5082
<211> 20
<212> PRT
<213> Hordeum vulgare

<400> 5082

Gln Gln Pro Gln Pro Phe Ser Gln Gln Pro Ile Pro Gln Gln Pro Gln
1 5 10 15

Pro Tyr Pro Gln
20

<210> 5083
<211> 20
<212> PRT
<213> Hordeum vulgare

<400> 5083

Gln Ser Gln Gln Gln Phe Pro Gln Pro Gln Gln Pro Phe Pro Gln Gln
1 5 10 15

Pro Gln Gln Pro
20

<210> 5084
<211> 20
<212> PRT
<213> Hordeum vulgare

<400> 5084

Pro Gln Pro Phe Pro Gln Gln Pro Ile Pro Gln Gln Pro Gln Pro Tyr
1 5 10 15

Pro Gln Gln Pro
20

<210> 5085
<211> 20
<212> PRT
<213> Hordeum vulgare

<400> 5085

Gln Gln Pro Phe Pro Gln Gln Pro Phe Pro Gln Gln Pro Gln Pro Tyr
1 5 10 15

Pro Gln Gln Pro
20

<210> 5086
<211> 20
<212> PRT
<213> Hordeum vulgare

<400> 5086

Pro Gln Gln Pro Gln Gln Pro Phe Pro Gln Pro Gln Gln Pro Phe Ser
1 5 10 15

Trp Gln Pro Gln
20

<210> 5087
<211> 20
<212> PRT
<213> Hordeum vulgare

<400> 5087

Gln Pro Gln Pro Tyr Pro Gln Gln Pro Gln Pro Tyr Pro Gln Gln Pro
1 5 10 15

Phe Gln Pro Gln
20

<210> 5088
<211> 20
<212> PRT
<213> Hordeum vulgare

<400> 5088

Gln Gln Pro Phe Pro Gln Gln Pro Phe Pro Gln Gln Pro Gln Pro Tyr
1 5 10 15

Pro Gln Gln Pro
20

<210> 5089
<211> 20
<212> PRT
<213> Hordeum vulgare

<400> 5089

Pro Gln Pro Tyr Pro Gln Gln Pro Gln Pro Phe Pro Gln Gln Pro Pro
1 5 10 15

Phe Cys Gln Gln
            20

<210> 5090
<211> 20
<212> PRT
<213> Hordeum vulgare

<400> 5090

Phe Gln Gln Pro Gln Gln Ser Tyr Pro Val Gln Pro Gln Gln Pro Phe
1   5   10   15

Pro Gln Pro Gln
            20

<210> 5091
<211> 20
<212> PRT
<213> Hordeum vulgare

<400> 5091

Tyr Pro Gln Gln Pro Gln Pro Phe Pro Gln Gln Pro Ile Pro Gln Gln
1   5   10   15

Pro Gln Pro Tyr
            20

<210> 5092
<211> 20
<212> PRT
<213> Hordeum vulgare

<400> 5092

Gln Gln Gln Pro Phe Pro Gln Gln Pro Ile Pro Gln Gln Pro Gln Pro
1   5   10   15

Tyr Pro Gln Gln
            20

<210> 5093
<211> 20
<212> PRT
<213> Hordeum vulgare

<400> 5093

Gln Pro Gln Gln Pro Gln Pro Phe Pro Gln Gln Pro Val Pro Gln Gln
1   5   10   15

Pro Gln Pro Tyr

20

<210> 5094
<211> 20
<212> PRT
<213> Hordeum vulgare

<400> 5094

Gln Pro Gln Pro Phe Pro Gln Gln Pro Ile Pro Leu Gln Pro His Gln
1 5 10 15

Pro Tyr Thr Gln
20

<210> 5095
<211> 20
<212> PRT
<213> Hordeum vulgare

<400> 5095

Leu Pro Arg Pro Gln Gln Pro Phe Pro Trp Gln Pro Gln Gln Pro Phe
1 5 10 15

Pro Gln Pro Gln
20

<210> 5096
<211> 20
<212> PRT
<213> Hordeum vulgare

<400> 5096

Gln Gln Pro Phe Pro Leu Gln Pro Gln Gln Pro Phe Pro Gln Pro Gln
1 5 10 15

Pro Phe Pro Gln
20

<210> 5097
<211> 20
<212> PRT
<213> Hordeum vulgare

<400> 5097

Pro Phe Pro Gln Gln Pro Gln Gln Pro Phe Pro Gln Pro Gln Gln Pro
1 5 10 15

Phe Arg Gln Gln
20

<210> 5098
<211> 20
<212> PRT
<213> Hordeum vulgare

<400> 5098

Pro Gln Gln Pro Phe Gln Pro Gln Gln Pro Phe Pro Gln Gln Thr Ile
1 5 10 15

Pro Gln Gln Pro
20

<210> 5099
<211> 20
<212> PRT
<213> Hordeum vulgare

<400> 5099

Asn Pro Leu Gln Pro Gln Gln Pro Phe Pro Leu Gln Pro Gln Pro Pro
1 5 10 15

Gln Gln Pro Phe
20

<210> 5100
<211> 20
<212> PRT
<213> Hordeum vulgare

<400> 5100

Asn Pro Leu Gln Pro Gln Gln Pro Phe Pro Leu Gln Pro Gln Pro Pro
1 5 10 15

Gln Gln Pro Phe
20

<210> 5101
<211> 20
<212> PRT
<213> Hordeum vulgare

<400> 5101

Pro Phe Pro Gln Gln Pro Gln Gln Pro Phe Pro Gln Pro Gln Gln Pro
1 5 10 15

Phe Arg Gln Gln
20

<210> 5102
<211> 20
<212> PRT

<213> Hordeum vulgare

<400> 5102

Gln Pro Gln Gln Pro Phe Pro Leu Gln Pro Gln Gln Pro Phe Pro Trp
1 5 10 15

Gln Pro Gln Gln
20

<210> 5103
<211> 20
<212> PRT
<213> Hordeum vulgare

<400> 5103

Thr Phe Pro Pro Ser Gln Gln Pro Asn Pro Leu Gln Pro Gln Gln Pro
1 5 10 15

Phe Pro Leu Gln
20

<210> 5104
<211> 20
<212> PRT
<213> Hordeum vulgare

<400> 5104

Pro Gln Gln Thr Ile Pro Gln Gln Pro Gln Gln Pro Phe Pro Leu Gln
1 5 10 15

Pro Gln Gln Pro
20

<210> 5105
<211> 20
<212> PRT
<213> Hordeum vulgare

<400> 5105

Gln Pro Gln Gln Pro Phe Ser Phe Ser Gln Gln Pro Gln Gln Pro Phe
1 5 10 15

Pro Leu Gln Pro
20

<210> 5106
<211> 20
<212> PRT
<213> Hordeum vulgare

<400> 5106

Gln Gln Pro Phe Pro Gln Gln Pro Phe Pro Gln Gln Pro Gln Pro Tyr
1 5 10 15

Pro Gln Gln Pro
20

<210> 5107
<211> 20
<212> PRT
<213> Secale cereale

<400> 5107

Gln Gln Leu Pro Leu Gln Pro Gln Gln Pro Phe Pro Gln Pro Gln Gln
1 5 10 15

Pro Ile Pro Gln
20

<210> 5108
<211> 20
<212> PRT
<213> Secale cereale

<400> 5108

Ser Ile Pro Gln Pro Gln Gln Pro Phe Pro Gln Pro Gln Gln Pro Phe
1 5 10 15

Pro Gln Ser Gln
20

<210> 5109
<211> 20
<212> PRT
<213> Secale cereale

<400> 5109

Gln Pro Phe Pro Gln Pro Gln Gln Pro Thr Pro Ile Gln Pro Gln Gln
1 5 10 15

Pro Phe Pro Gln
20

<210> 5110
<211> 20
<212> PRT
<213> Secale cereale

<400> 5110

Gln Pro Phe Pro Gln Pro Gln Gln Pro Thr Pro Ile Gln Pro Gln Gln
1 5 10 15

Pro Phe Pro Gln
            20

<210> 5111
<211> 20
<212> PRT
<213> Secale cereale

<400> 5111

Pro Ala Pro Ile Gln Pro Gln Gln Pro Phe Pro Gln Gln Pro Gln Gln
1   5   10   15

Pro Phe Pro Gln
            20

<210> 5112
<211> 20
<212> PRT
<213> Secale cereale

<400> 5112

Pro Gln Gln Pro Phe Pro Gln Gln Pro Glu Gln Ile Ile Pro Gln Gln
1   5   10   15

Pro Gln Gln Pro
            20

<210> 5113
<211> 20
<212> PRT
<213> Secale cereale

<400> 5113

Gln Tyr Ser Pro Tyr Gln Pro Gln Gln Pro Phe Pro Gln Pro Gln Gln
1   5   10   15

Pro Thr Pro Ile
            20

<210> 5114
<211> 20
<212> PRT
<213> Secale cereale

<400> 5114

Ser Gln Gln Pro Gln Arg Pro Gln Gln Pro Phe Pro Gln Gln Pro Gln
1   5   10   15

Gln Ile Ile Pro

20

<210> 5115
<211> 20
<212> PRT
<213> Secale cereale

<400> 5115

Gln Gln Leu Pro Leu Gln Pro Gln Gln Pro Phe Pro Gln Pro Gln Gln
1 5 10 15

Pro Ile Pro Gln
20

<210> 5116
<211> 20
<212> PRT
<213> Secale cereale

<400> 5116

Phe Pro Leu Gln Pro Gln Gln Pro Phe Pro Gln Gln Pro Glu Gln Ile
1 5 10 15

Ile Ser Gln Gln
20

<210> 5117
<211> 20
<212> PRT
<213> Secale cereale

<400> 5117

Pro Gln Gln Pro Phe Pro Gln Gln Pro Glu Gln Ile Ile Pro Gln Gln
1 5 10 15

Pro Gln Gln Pro
20

<210> 5118
<211> 20
<212> PRT
<213> Secale cereale

<400> 5118

Phe Pro Gln Gln Pro Gln Gln Pro Phe Pro Gln Pro Gln Gln Gln Leu
1 5 10 15

Pro Leu Gln Pro
20

<210> 5119
<211> 20
<212> PRT
<213> Secale cereale

<400> 5119

Ser Pro Gln Pro Gln Gln Pro Tyr Pro Gln Gln Pro Phe Pro Gln Gln
1 5 10 15

Pro Gln Gln Pro
20

<210> 5120
<211> 20
<212> PRT
<213> Secale cereale

<400> 5120

Gln Gln Pro Gln Gln Pro Phe Pro Leu Gln Pro Gln Gln Pro Val Pro
1 5 10 15

Gln Gln Pro Gln
20

<210> 5121
<211> 20
<212> PRT
<213> Secale cereale

<400> 5121

Gln Pro Gln Gln Ile Ile Pro Gln Gln Pro Gln Gln Pro Phe Pro Leu
1 5 10 15

Gln Pro Gln Gln
20

<210> 5122
<211> 20
<212> PRT
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<400> 5122

Pro Gln Gln Pro Phe Pro Gln Gln Pro Glu Gln Ile Ile Pro Gln Gln
1 5 10 15

Pro Gln Gln Pro
20

<210> 5123
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<213> Secale cereale

<400> 5123

Gln Thr Gln Gln Ser Ile Pro Gln Pro Gln Gln Pro Phe Pro Gln Pro
1 5 10 15

Gln Gln Pro Phe
20

<210> 5124
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<400> 5124

Gln Gln Pro Phe Leu Leu Gln Pro Gln Gln Pro Phe Ser Gln Pro Gln
1 5 10 15

Gln Pro Phe Leu
20

<210> 5125
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<212> PRT
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<400> 5125

Gln Gln Pro Gln Gln Pro Phe Pro Leu Gln Pro Gln Gln Pro Val Pro
1 5 10 15

Gln Gln Pro Gln
20

<210> 5126
<211> 20
<212> PRT
<213> Secale cereale

<400> 5126

Glu Gln Ile Ile Ser Gln Gln Pro Phe Pro Leu Gln Pro Gln Gln Pro
1 5 10 15

Phe Ser Gln Pro
20

<210> 5127
<211> 20
<212> PRT
<213> Secale cereale

<400> 5127

Asn Met Gln Val Gly Pro Ser Gly Gln Val Glu Trp Pro Gln Gln Gln
1 5 10 15

Pro Leu Pro Gln
20

<210> 5128
<211> 20
<212> PRT
<213> Secale cereale

<400> 5128

Pro Gln Gln Leu Phe Pro Leu Pro Gln Gln Pro Phe Pro Gln Pro Gln
1 5 10 15

Gln Pro Phe Pro
20

<210> 5129
<211> 20
<212> PRT
<213> Secale cereale

<400> 5129

Pro Gln Thr Gln Gln Pro Gln Gln Pro Phe Pro Gln Pro Gln Gln Pro
1 5 10 15

Gln Gln Leu Phe
20

<210> 5130
<211> 20
<212> PRT
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<400> 5130

Ser Pro Gln Gln Pro Gln Leu Pro Phe Pro Gln Pro Gln Gln Pro Phe
1 5 10 15

Val Val Val Val
20

<210> 5131
<211> 20
<212> PRT
<213> Secale cereale

<400> 5131

Phe Pro Gln Gln Pro Glu Gln Ile Ile Ser Gln Gln Pro Gln Gln Pro
1 5 10 15

Phe Pro Leu Gln
            20

<210> 5132
<211> 20
<212> PRT
<213> Secale cereale

<400> 5132

Pro Ala Pro Ile Gln Pro Gln Gln Pro Phe Pro Gln Gln Pro Gln Gln
1   5   10   15

Pro Phe Pro Gln
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<210> 5133
<211> 20
<212> PRT
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<400> 5133

Pro Gln Glu Pro Gln Gln Leu Phe Pro Gln Ser Gln Gln Pro Gln Gln
1   5   10   15

Pro Phe Pro Gln
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<210> 5134
<211> 20
<212> PRT
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<400> 5134

Ser Pro Gln Pro Gln Gln Pro Tyr Pro Gln Gln Pro Phe Pro Gln Gln
1   5   10   15

Pro Gln Gln Pro
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<210> 5135
<211> 20
<212> PRT
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<400> 5135

Pro Thr Pro Ile Gln Pro Gln Gln Pro Phe Pro Gln Arg Pro Gln Gln
1   5   10   15

Pro Phe Pro Gln

20

<210> 5136
<211> 15
<212> PRT
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<220>
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<400> 5136

Leu Gln Pro Phe Pro Gln Pro Glu Leu Pro Tyr Pro Gln Pro Gln
1 5 10 15

<210> 5137
<211> 14
<212> PRT
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<220>
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<400> 5137

Gln Pro Phe Pro Gln Pro Glu Gln Pro Phe Pro Trp Gln Pro
1 5 10

<210> 5138
<211> 15
<212> PRT
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<220>
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<400> 5138

Pro Glu Gln Pro Ile Pro Glu Gln Pro Gln Pro Tyr Pro Gln Gln
1 5 10 15

<210> 5139
<211> 16
<212> PRT
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<400> 5139

Pro Gln Gln Pro Phe Pro Gln Pro Glu Gln Pro Phe Pro Trp Gln Pro
1 5 10 15

<210> 5140
<211> 16
<212> PRT
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<400> 5140

Phe Pro Glu Gln Pro Ile Pro Glu Gln Pro Gln Pro Tyr Pro Gln Gln
1 5 10 15